APPENDIX A

NOTE: Pursuant to Fed. Cir. R. 47.6, this disposition is not citable as precedent. It is a public record. This disposition will appear in tables published periodically.

United States Court of Appeals for the Federal Circuit

99-1584, 00-1005

INSITUFORM TECHNOLOGIES, INC., INSITUFORM (NETHERLANDS) B.V., and INSITUFORM GULF SOUTH, INC.,
Plaintiffs/Cross-Appellants,

v.

CAT CONTRACTING, INC., FIRSTLINER U.S.A, INC., and GIULIO CATALLO,
Defendants-Appellants,
and
MICHIGAN SEWER CONSTRUCTION COMPANY,
Defendant-Appellant,
and
KANAL SANIERUNG HANS MUELLER GmbH & CO. KG,
Defendant-Appellee.

DECIDED: March 26, 2001

Before MAYER, Chief Judge, MICHEL, and SCHALL, Circuit Judges.

SCHALL, Circuit Judge.

DECISION

Cat Contracting, Inc., Firstliner U.S.A., Inc.,[1] Guilio Catallo, and Michigan Sewer Construction Company (collectively, "Appellants") appeal the joinder of Insituform (Netherlands) B.V. ("Insituform B.V.") as a plaintiff and the award of damages for infringement under the doctrine of equivalents of United States Patent No. 4,366,012 (the "'012 Patent") by the United States District Court for the Southern District of Texas. *Insituform Techs., Inc. v. Cat Contracting, Inc.*, No. H-90-1690, slip op. at 21-22, 39-40, 57 (S.D. Tex. Aug. 31, 1999) ("*Insituform IV*"). Cat Contracting, Inc. and Mr. Catallo also appeal the joinder of Mr. Catallo to the suit as a defendant after the liability and damages trials had concluded. *Insituform Techs., Inc. v. Cat Contracting, Inc.*, No. H-90-1690, slip op. at 8 (Aug. 30, 1999) (order) ("*Insituform III*"). Insituform Technologies, Inc. ("ITI"), Insituform B.V., and Insituform Gulf South, Inc. ("IGS") (collectively, "Insituform") cross-appeal the district court's finding that Kanal Mueller Gruppe International ("KMGI") is not the alter ego of Kanal Sanierung Hans Mueller GmbH & Co. KG ("KS"). *Insituform IV*, slip op. at 44-45. After oral argument in this appeal, Appellants and KS filed motions asking us to apply our holdings in *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, Ltd., 234 F.3d 558, 56 USPQ2d 1865 (Fed. Cir. 2000), to the case and, in light of *Festo*, vacate the district court's judgment of infringement under the doctrine of equivalents. We agree with Appellants and KS and conclude that the holdings in *Festo* must be applied to the earlier finding of infringement, and that, under *Festo*, prosecution history estoppel bars a finding

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[1] Firstliner U.S.A. was formally known as Inliner U.S.A.

of infringement under the doctrine of equivalents in this case. Therefore, we *reverse-in-part, vacate-in-part*, and *remand*.

DISCUSSION

I.

The '012 patent discloses a process for repairing damaged pipelines and passageways. The patent claims a method for performing such repair without removing the damaged pipe from the ground by installing a liner into the damaged pipe. Claim 1, the only claim still at issue, describes a method for impregnating the flexible tube liner with resin prior to insertion of the liner into the damaged pipe. The claimed method involves a liner that has an impermeable film on the outside and a resin-absorbent, felt layer on the inside. A vacuum is applied to the inside of the liner by cutting a window into the outer, impermeable film, applying a cup (a "vacuum cup") to the outside of the window, and connecting the other end of the cup to a vacuum source. Using the created vacuum, a section of the inside of the liner is impregnated with resin. The vacuum cup is then moved to another section of the liner while the previously used window is sealed. This process for impregnating the liner with resin allows for impregnation at the jobsite, eliminating the need to transport a heavier, already-impregnated liner to the site.

Insituform alleged that two processes practiced by the Appellants infringed the '012 patent. The first process ("Process 1") involved the use of four to six vacuum cups to draw a vacuum from a corresponding four to six windows in the liner. As each vacuum cup was removed, the corresponding window was sealed while the remaining vacuum cups downstream continued to

create a vacuum in the liner. *Insituform Techs., Inc. v. Cat Contracting, Inc.*, 99 F.3d 1098, 1104-05, 40 USPQ2d 1602, 1607 (Fed. Cir. 1996) ("*Insituform I*"). The second process ("Process 2") involved the use of multiple needles instead of vacuum cups to create a vacuum, with each needle being inserted through both the outer, impermeable film layer and the inner, resin-absorbent layer. *Insituform Techs., Inc. v. Cat Contracting, Inc.*, 161 F.3d 688, 690-91, 48 USPQ2d 1610, 1612 (Fed. Cir. 1998) ("*Insituform II*").[2]

Insituform sued Appellants in February of 1990, alleging infringement of the '012 patent. *Insituform I*, 99 F.3d at 1101, 40 USPQ2d at 1603. The issues of infringement and damages were bifurcated by order of the district court on March 5, 1991. In June of 1991, after a two-week jury trial, the jury returned a verdict of general infringement and no invalidity. *Id.* The district court granted, in part, Appellants' motion for a judgment as a matter of law ("JMOL"), finding no literal infringement. However, the court upheld the jury's finding of validity. In addition, the court ruled that the issue of infringement under the doctrine of equivalents should be tried. *Id*. In February of 1995, the issue of infringement by equivalents was retried in a three day bench trial, after which the district court found that the practice of both Process 1 and Process 2 infringed claim 1 of the '012 patent under the doctrine of equivalents. *Id.* at 1101, 40 USPQ2d at 1603-04. Appellants appealed

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[2] *Insituform II* replaced our opinion in *Insituform Techs., Inc. v. Cat Contracting, Inc.*, 156 F.3d 1199, 48 USPQ2d 1019 (Fed. Cir. 1998), that was recalled after our order granting a petition for rehearing by KS, *Insituform Techs., Inc. v. Cat Contracting, Inc.*, No. 97-1232 (Fed. Cir. Oct. 30, 1998) (order).

that finding, while Insituform cross-appealed the district court's grant of JMOL of no literal infringement.

In *Insituform I*, we affirmed the district court's JMOL of no literal infringement. *Id.* at 1106-07, 40 USPQ2d at 1608. We vacated, however, the court's holding that Process 1 and Process 2 infringed under the doctrine of equivalents. *Id.* at 1109, 40 USPQ2d at 1610. In our decision, we addressed Appellants' contention that prosecution history estoppel precluded a finding of infringement by equivalents. *Id.* at 1107-08, 40 USPQ2d at 1608-10. We noted that the '012 patent's original application contained four claims relevant to Appellants' prosecution history estoppel argument. *Id.* at 1108, 40 USPQ2d at 1609. We observed that the first two claims "would likely have read on a process using a single cup or a single needle . . . [or] multiple cups or multiple needles." *Id.* We stated that, in response to the examiner's rejection of the four claims over the Everson reference "Insituform canceled the claims and filed new, narrower claims, including what is now claim 1," which we held was "literally limited to the use of one vacuum cup . . .." *Id.*, 40 USPQ2d at 1610. Based on these amendments, we concluded that Insituform "gave up coverage to a process for which a single vacuum source is located at the far end of the tube," but that it could not be concluded that "Insituform relinquished coverage of processes using either multiple vacuum sources or a continuous vacuum." *Id.* at 1108-09, 40 USPQ2d at 1610. We held that prosecution history estoppel did not preclude Insituform from asserting that claim 1 of the '012 patent was infringed by Process 1 or Process 2 under the doctrine of equivalents. *Id.* at 1109, 40 USPQ2d at 1610. We remanded the case to the district court for a determination as to whether, under the correct claim con-

struction—that claim 1 of the '012 patent required the process to use only one vacuum cup, Process 1 or Process 2 infringed under the doctrine of equivalents. *Id.*

Upon remand, the district court, on December 31, 1996, issued revised findings of fact and conclusions of law that found that both Process 1 and Process 2 infringed under the doctrine of equivalents. Appellants appealed. While Appellants' appeal was before this court, the district court, in early September of 1997, conducted a four day bench trial on the issue of damages. The district court issued its findings of fact and conclusions of law on the issue of damages on September 3, 1998, finding damages for the Appellants' use of both Process 1 and Process 2.

We issued our decision on Appellants' second appeal on November 17, 1998. We upheld the district court's finding that Process 1 infringed the '012 patent under the doctrine of equivalents. *Insituform II*, 161 F.3d at 690, 48 USPQ2d at 1614. However, we reversed the district court's finding that Process 2 infringed under the doctrine of equivalents based on (i) the evidence of substantial differences between Process 2 and the claimed use of a single vacuum cup and (ii) "the district court's legal error in defining incorrectly the 'way' in its function-way-result analysis and dismissing structural differences as irrelevant." *Id.* at 693-95, 48 USPQ2d at 1615. We also held that the district court had erred in finding that KS induced infringement of the '012 patent because KS did not have knowledge of the '012 patent when it licensed the infringing Process 1 to Firstliner U.S.A., Inc.. *Id.* at 695, 48 USPQ2d at 1616. We remanded the case to the district court to determine whether KMGI, who continued to license Process 1 to Firstliner after Insituform filed suit against KS in 1990,

was KS's alter ego, so that KMGI's activities of licensing Process 1 after KS gained knowledge of the '012 patent could be attributed to KS. *Id.*

Upon remand, the district court recognized that it needed to address the question of whether KMGI was KS's alter ego and that it needed to recalculate its earlier damage award to only include the harm done by the Appellants' practice of Process 1. *Insituform IV*, slip op. at 2-3. To facilitate these changes to its earlier findings of fact and conclusions of law, the court permitted additional discovery and briefing by the parties. The parties conducted the permitted discovery and filed various motions. Thereafter, without any in-court testimony, the court issued revised findings of fact and conclusions of law.

The district court found that KMGI was not KS's alter ego and that KS thus was not liable for infringement by inducement. *Id.* at 42-45. The court also recalculated the damages to Insituform unique to Appellants' practice of Process 1. *Id.* at 34-36. Additionally, the court found that Insituform B.V., the current owner of the '012 patent, had properly been joined as a party to the suit via a previous order of the court on November 30, 1994. *Id.* at 21-22. Finally, the court granted Insituform's motion to add Mr. Catallo as a party a day before the above described revised findings of fact and conclusions of law were issued. *Insituform III*, slip op. 4-9. The court concluded that there would be no prejudice in adding Mr. Catallo as a party after the liability and damages trials had concluded. *Id.* at 8-9.

Appellants' appealed the district court's revised finding of facts and conclusions of law. Insituform cross-appealed the district court's finding that KMGI was not

the alter ego of KS. Oral argument was heard on November 3, 2000. Thereafter, on November 29, 2000, we issued our en banc decision in *Festo*. In *Festo*, we held that a narrowing amendment to a claim limitation made for a substantial reason related to patentability completely bars the application of the doctrine of equivalents to that amended claim limitation. *Festo*, 234 F.3d at 563-64, 56 USPQ2d at 1868.

On December 28, 2000, Appellants filed a motion asking us to apply *Festo* to this case and, after doing so, to vacate the district court's judgment that they were liable for infringement under the doctrine of equivalents. On January 2, 2001, KS filed a motion asking us to apply *Festo*. However, in its motion, KS urged *Festo* only as an alternative ground in support of the judgment in its favor. KS's first choice is to have us affirm the ruling of the district court that it cannot be liable for infringement on Insituform's alter ego theory relating to KMGI. Insituform responded to the post-argument motions, and Appellants and KS submitted replies.

II.

Appellants' and KS's post-oral argument motions present two questions. The first questions is whether we can apply the holdings of *Festo* to our two earlier decisions in this case, *Insituform I* and *Insituform II*, and the final judgment of the district court that is before us in this appeal. The second question is whether, if we can revisit the earlier decisions in this case and apply our holdings in *Festo*, *Festo* bars any range of equivalents for the vacuum method limitation in claim 1 of the '012 patent and thus mandates a finding of no infringement under the doctrine of equivalents.

With regard to the first question, Insituform argues that our holdings in *Festo* cannot be applied to the present appeal or to our earlier decisions in this case. Insituform asserts that the issue of liability was decided by this court in *Insituform II* and was the subject of a final judgment by the district court over a year ago, entered pursuant to the decision in *Insituform II*. Insituform contends that we may only apply new law, such as *Festo*, to issues that are properly presented for decision in this appeal and that the question of infringement of the '012 patent by Appellants is not before us. Insituform indicates that the only issues this court can address are damages, the joinder of Mr. Catallo and Insituform B.V., and whether KMGI is the alter ego of KS. Appellants and KS respond that the holdings in *Festo* must be applied to all pending cases, which include this one. They also argue that even though the questions of prosecution history estoppel and of infringement under the doctrine of equivalents were already decided by this court in *Insituform I* and *Insituform II*, since *Festo* changed the law under which those previous decisions were made, the law of the case doctrine does not preclude our reconsideration of those earlier holdings.

Since we applied the rule of law established in *Festo* to the parties in that case, *Festo*, 234 F.3d at 587-91, 56 USPQ2d at 1885-90, the holding in Festo "must be given full retroactive effect in all cases still open on direct review and as to all events, regardless of whether such events predate or postdate [the] announcement of the rule." *Harper v. Va. Dep't of Taxation*, 509 U.S. 86, 97 (1993). When a court has "applied a rule of law to the litigants in one case it must do so with respect to all others not barred by procedural requirements or res

judicata." *James B. Beam Distilling Co. v. Ga.*, 501 U.S. 529, 544 (1991). Thus, even if we have already decided issues regarding prosecution history estoppel and infringement under the doctrine of equivalents in a previous decision, if those issues are still open on direct review, we must apply the holdings of *Festo*.

Insituform is correct that a final judgment is binding under the doctrine of res judicata and that a final judgment was entered by the district court in this case on August 31, 1999. However, that final judgment is the very judgment that is now presented to us for review in this appeal. Since the judgment is still open and before us for review, we are required, under the Supreme Court's decisions in *Harper* and *James B. Beam*, to apply our holdings in *Festo*. *See Harper*, 509 U.S. at 94-97; *James B. Beam*, 501 U.S. at 541-44. Additionally, our decisions in *Insituform I*, 99 F.3d at 1109, 40 USPQ2d at 1610, and *Insituform II*, 161 F.3d at 695, 48 USPQ2d at 1616, were not final judgments because both remanded the case back to the district court for further proceedings. Our decisions cannot be given res judicata effect. *See Mendenhall v. Barber-Greene Co.*, 26 F.3d 1573, 1580-81, 31 USPQ2d 1001, 1005-07 (Fed. Cir. 1994) (noting that an earlier decision on liability was not binding because it "resulted in a remand for further proceedings").

The law of the case doctrine may, however, bar this court from revisiting our decisions in *Insituform I* and *Insituform II*. The doctrine generally prohibits a court from revisiting an issue once it has been previously decided in a pending litigation. *Mendenhall*, 26 F.3d at 1580-81, 31 USPQ2d at 1005-07; *see also Az. v. Cal.*, 460 U.S. 605, 618-19 (1983); *Koyo Seiko Co., Ltd. v. United States*, 95 F.3d 1094, 1097 (Fed. Cir. 1996). The law of

the case doctrine is not, however, a limitation on a court's judicial power. Rather, it is a doctrine that directs a court's discretion to revisit issues. *Mendenhall*, 26 F.3d at 1582, 31 USPQ2d at 1007. There are three well-established exceptions to the law of the case doctrine, one of which is where "controlling authority has since made a contrary decision of the law applicable to the issues." *Gould, Inc. v. United States*, 67 F.3d 925, 930 (Fed. Cir. 1995). An intervening change in applicable authority can be the basis to reconsider an earlier decision. *Mendenhall*, 26 F.3d at 1582, 31 USPQ2d at 1007.

Here, *Festo* represents an intervening change in controlling authority. In *Insituform I* and *Insituform II*, we held that Insituform's amendments to the claims of the '012 patent did "not prohibit application of the doctrine of equivalents completely, but only with respect to the subject matter surrender of a large, single vacuum source . . . ." *Insituform II*, 161 F.3d at 692, 48 USPQ2d at 1614. Under *Festo*, in contrast, once prosecution history estoppel 11 by amendment is found, all equivalent subject matter is surrendered. *Festo*, 234 F.3d at 569, 56 USPQ2d at 1872. *Festo* falls into the above-noted exception to the law of the case doctrine because it represents a change in the authority that controlled *Insituform I* and *Insituform II* and that allowed this court to find that Insituform's narrowing claim amendments caused a surrender of a limited range of equivalents, instead of a surrender of all equivalents.

Our conclusion, that *Festo* can be applied in this case, is supported by our recent decision in *Litton Systems, Inc. v. Honeywell Inc.*, 238 F.3d 1376, 57 USPQ2d 1653 (Fed. Cir. 2001). In *Litton*, we reconsidered one of our

earlier decisions in the case in light of our holdings in *Festo*. *Id.* at 1380-81, 57 USPQ2d at 1656-57. We recognized that, in the earlier decision, we had applied the flexible bar approach to prosecution history estoppel and had remanded the case to the district court to determine whether there was infringement under the doctrine of equivalents. *Id.* at 1380, 57 USPQ2d at 1656. In *Festo*, however, we specifically repudiated the flexible bar. *Id.* We stated in *Litton* that "[b]ecause we have adopted a contrary rule of law regarding the scope of prosecution history estoppel for amended claim limitations, the law of the case doctrine does not preclude us from applying the complete bar adopted en banc in *Festo*." *Id.* We proceeded to hold that, under *Festo,* Litton was estopped from claiming any equivalents to the amended claim limitation in dispute. *Id.* Based on the complete bar, we upheld the district court's grant of JMOL and summary judgment of no infringement under the doctrine of equivalents. *Id.* at 1381, 57 USPQ2d at 1657.

We are mandated, under the Supreme Court's decisions in *Harper* and *James B. Beam,* to apply the rule of law announced in *Festo* to all cases before us for review in which the application of *Festo* is not barred by procedural requirements or res judicata. As noted above, res judicata does not bar our review of infringement because the only final judgment in this case is before us in this appeal. In addition, the law of the case doctrine does not apply because *Festo* was an intervening decision that changed the law upon which the district court relied and the law upon which we relied on in *Insituform I* and *Insituform II*.

III.

Turning, to the second question presented by the post-oral argument motions, Insituform contends that prosecution history estoppel does not apply to claim 1 of the '012 patent because claim 1 does not include any limitations that were not already found in claims 1-4 of the original application. Insituform asserts that the claim limitation in question, the use of a single cup to create a vacuum, was present in original claim 4. Therefore, Insituform argues, the claim limitation was not added or amended to secure allowance, and the complete bar to equivalents does not apply. Appellants and KS respond by arguing that during the prosecution of the '012 patent, Insituform, in response to the examiner's rejection under 35 U.S.C. § 103, canceled its original independent claim 1, and substituted it with a new independent claim that was narrower in scope than the original claim. They assert that Insituform narrowed the scope of the original claim by amending the vacuum method claim limitation to describe the use of a single vacuum cup. Appellants and KS conclude that since this amendment narrowed the vacuum method limitation, *Festo* bars any range of equivalents for the claimed use of a single vacuum cup.

We noted in *Insituform I* that Appellants' Process 1 involved the use of four to six cups to draw a vacuum from a corresponding number of slits in a flexible tube in order to impregnate the entire resin absorbent inner layer with resin. *Insituform I,* 99 F.3d at 1104-05, 40 USPQ2d at 1607. Appellants argued to this court, and the district court, that prosecution history estoppel limited issued claim 1 to the specific vacuum method described—a one cup process. Id. at 1107, 40 USPQ2d at 1609. In *Insituform I*, we indicated that issued claim 1

was limited to the use of one vacuum cup, but noted that original claim 1 did not limit the number of cups used to create a vacuum. Id., at 1108, 40 USPQ2d at 1610. Original claim 1 stated, in relevant part, that:

> . . . the resin absorbent layer is impregnated with a curable resin *by applying a vacuum to the inside of a flexible tube* whilst the resin is brought into impregnation contact with the resin absorbent material . . . .

Id. at 1103, 40 USPQ2d at 1605 (emphasis added). Original claim 2 depended from claim 1 and further limited claim 1 to a specific quantity of resin. *Id.*, 40 USPQ2d at 1606. Original claim 3 depended from claims 1 and 2 and further limited the two claims to the use of a nip roller for feeding the resin into the flexible tube. *Id.* Original claim 4 depended from claims 1 and 2 and limited the two claims to the use of one vacuum cup. Id. at 1103-04, 40 USPQ2d at 1606. These four original claims were rejected under 35 U.S.C. § 112 for lack of specificity and under 35 U.S.C. § 103 in light of the Everson reference. *Id.* at 1104, 40 USPQ2d at 1606.

In response, Insituform canceled all of its claims, claims 1-9, and added claim 10, which it indicated incorporated the substance of original claims 1-4. I*d.* Claim 10 described, in relevant part, the:

> . . . drawing through the window a vacuum in the interior of the tube downstream of said one end by *disposing over the window a cup connected by a flexible hose to a vacuum source* which cup prevents ingress of air into the interior of the tube while the tube is being evacuated, the outer layer of the tube being substantially impermeable to air . . . .

Id. (emphasis added). Insituform argued that the amendments taught an improvement over Everson. *Id.* The examiner allowed the claims without further comment. Id. Claim 10 was renumbered as claim 1 of the issued patent. *Id.*

Notably, Insituform does not argue that the above amendments were not made for a substantial reason related to patentability. Rather, it argues that the amendments did not narrow the original claims and did not amend the vacuum method limitation. However, present claim 1 is narrower than any of the original claims considering that it includes limitations from original claims 1-4 and that original claim 4 only included limitations from claims 1-2. Indeed, we noted in *Insituform I* that "Insituform canceled [claims 1-4] and filed new, narrowed claims, including what is now claim 1." *Id.* at 1108, 40 USPQ2d at 1609. In addition, claim 1 was amended as to the specific claim limitation at issue—the method used to create a vacuum. The original claim 1 did not limit the number of cups that could be used to create a vacuum, while the new claim 1 did present such a limitation. Insituform substituted the new claim for the original independent claim 1 and narrowed the scope of the vacuum method limitation during prosecution.

The factual scenario present in the '012 patent's prosecution is very similar to that presented in *Festo* with respect to the Stoll patent. The Stoll patent contained an original claim 1 that did not have a magnetizable sleeve limitation, but dependant claim 8, depending from claim 1, did have such a limitation. *Festo*, 234 F.3d at 582-83, 56 USPQ2d at 1834. Stoll cancelled claim 1 and claim 8, and presented a new, independent claim that included a magnetizable sleeve limitation.

Id. We noted that "we [were] presented with the situation where the added claim [limitation] was introduced through a new claim, instead of through an amendment to an original claim. Nevertheless, the addition of the magnetizable sleeve claim [limitation] can be said to have narrowed the scope of the original claim because the new claim replaced the original claim." *Id.* at 587-88. 56 USPQ2d at 1887. We concluded that prosecution history estoppel applied to the magnetizable sleeve limitation and that no range of equivalents could be asserted for this limitation. Id. at 588, 56 USPQ2d at 1888.

In this case, Insituform, during prosecution, replaced original independent claim 1 with a new independent claim. Therefore, as in *Festo* in the case of the Stoll patent, the original claim and the original claim as amended, the new claim, must be compared. The new claim, as we observed in *Insituform I*, includes a limitation as to the number of vacuums to be used, and thus the vacuum method limitation was narrowed. Under *Festo*, Insituform cannot assert any range of equivalents for this claim limitation. Thus, the Appellants' use of Process 1, which uses multiple cups, cannot infringe under the doctrine of equivalents, the only finding of infringement affirmed by this court, Insituform II, 161 F.3d at 692-93, 48 USPQ2d at 1614.

IV.

Since none of the Appellants, or KS, can be held liable for infringement of the '012 patent in light of *Festo*, an intervening change in controlling law in this case, the district court's final judgment of liability and damages must be reversed. As noted above, KS urges us to affirm the district court's ruling on the alter ego issue instead

of directing that the complaint against it be dismissed based upon *Festo*. However, the application of *Festo* disposes of Insituform's infringement claim with respect to both Appellants and KS, thereby rendering moot the alter ego issue with respect to KS.

In conclusion, we grant the Appellants' motion to vacate the judgment and KS's motion to apply this court's decision in *Festo*.[3] The judgment of infringement in favor of Insituform is reversed. We remand the case to the district court, which is instructed (i) to vacate all orders entered after the finding of infringement as moot, including those relating to damages and Mr. Catallo's joinder as a defendant; and (ii) to dismiss the case as to all parties.

Each party shall bear its own costs.

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[3]As noted, we do not render any decision on the issue of whether KMGI is the alter ego of KS.

APPENDIX B

United States Court of Appeals
for the Federal Circuit

97-1232

INSITUFORM TECHNOLOGIES, INC., INSITUFORM (NETHERLANDS) B.V. and INSITUFORM GULF SOUTH, INC.,
Plaintiffs-Appellees,
v.
CAT CONTRACTING, INC., MICHIGAN SEWER CONSTRUCTION, KANAL SANIERUNG HANS MUELLER GmbH & CO. KG and INLINER U.S.A.,
Defendants-Appellants.

Harold James, James & Franklin, of New York, New York, agued for plaintiffs-appellees.

Edward W. Goldstein, Tobor & Goldstein, L.L.P., of Houston, Texas, argued for defendants-appellants. With him on the brief was *John T. Polasek*.

Appealed from: U. S. District Court for the Southern District of Texas

Judge Vanessa D. Gilmore

United States Court of Appeals
for the Federal Circuit

97-1232

INSITUFORM TECHNOLOGIES, INC.,
INSITUFORM (NETHERLANDS) B.V. and
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CAT CONTRACTING, INC., MICHIGAN SEWER CONSTRUCTION, KANAL SANIERUNG HANS MUELLER GmbH & CO. KG and INLINER U.S.A.,
Defendants-Appellants.

DECIDED: Septembr 10, 1998

Before MICHEL, *Circuit Judge*, ARCHER, *Senior Circuit Judge*, and SCHALL, *Circuit Judge*.

MICHEL, *Circuit Judge*.

Defendants, Cat Contracting, Inc. ("CAT"), Michigan Sewer Construction ("MSC"), Kanal Sanierung Hans Mueller GmbH & Co. KG ("KM"), and Inliner U.S.A. ("Inliner") (collectively, "Defendants") appeal the judgment of the United States District Court for the Southern District of Texas in *Insituform Technologies, Inc. v. Cat Contracting, Inc.*, CA No. H-90-1690 (Dec. 31, 1996) (hereinafter, "*Insituform II*"), holding Inliner's Processes 1 and 2 each infringes claim 1 of United States Patent No. 4,336,012 (the "'012 patent") under the doctrine of equivalents and enjoining Defendants from practicing either Process 1 or 2. Because we hold that Inliner's Process 1 was shown to infringe the '012 patent, but

Inliner's Process 2 was not shown to infringe, we affirm-in-part, and reverse-in-part.

BACKGROUND

The '012 patent is directed towards a process for lining pipelines and passageways, particularly sewers, which may suffer from leaks. Using the patented method, damaged underground pipelines and passageways can be repaired without removing them from the ground. Claim 1 covers a method for the impregnation of a flexible tube liner prior to installing the liner in a damaged pipeline. The liner has an outer layer of impermeable film and an inner, resin-absorbent, felt layer. The claimed method involves applying a vacuum to the inside of the liner by cutting a window in the outer impermeable film layer, applying a cup to the outside of the window, and connecting the other end of the cup to a vacuum source using a flexible hose. As each section of the liner has its resin-absorbent material impregnated, the cup is moved downstream and the previous window is sealed. The process is repeated for respective lengths of liner until the entire liner has been impregnated. The resin-impregnated liner is then inserted into a damaged pipe. The method of installation in the pipe is not at issue here.

Inliner's Process 1, the "multiple cup process," uses four to six cups to draw a vacuum from a corresponding number of windows in the liner. When the cup closest to the advancing resin is removed and the window that was beneath it is sealed, the remaining downstream cups continue to draw a vacuum in the liner. *See Insituform Gulf South, Inc. v. CAT Contracting, Inc.*, 99 F.3d 1098, 1104-05, 40 USPQ2d 1602, 1607 (Fed. Cir. 1997) (hereafter, "*Insituform I*"). Interruption of the

vacuum during the impregnation process is thereby avoided or diminished by the use of the multiple cups. Inliner's Process 2, the "multiple needle process," replaces multiple cups with multiple metal tubes or needles. The needles are inserted through all of the layers of the liner rather than merely placed over holes in the outer layer, and they provide a continuous vacuum from inside the liner rather than through the felt. *See id.*[1]

In 1990, Insituform sued Defendants for infringement of the '012 patent and of United States Patent No. 4,009,063 (the "'063 patent"),[2] both claiming methods invented by Eric Wood and owned by Insituform Technologies, Inc. Liability and damages were bifurcated, and damages are not at issue here. In 1991, a jury returned a verdict that the '012 patent was infringed by both Processes 1 and 2 and was not invalid. The district judge granted Inliner's motion for JNOV with respect to literal infringement of both processes, and ordered a new trial with respect to infringement under the doctrine of equivalents. In 1995, at the retrial the court found equivalent infringement of claim 1 by both processes. On appeal, this court affirmed the order for JNOV with respect to literal infringement but vacated the district court's determination of equivalent infringement as based on an erroneous claim construction and remanded the case for re-determination of equivalent infringement based on the correct claim construction. *See Insituform I*, 99 F.3d at 1109, 40 USPQ2d at 1610. Method claim 1,

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1. Inliner did not develop Process 2 until 1991, after the first phase of the case had already been tried to a jury.

2. The '063 patent is not at issue in this appeal.

the only claim at issue, is reproduced below.[3] For background in the technology and in the patent in suit, the reader is directed to *Insituform I*, 99 F.3d 1098, 40

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[3] Claim 1:

1. A method of impregnating with a curable resin an inner layer of resin absorbent material disposed in an elongate flexible tube having an outer layer formed by an impremeable [sic] film, the method comprising the steps of

(1) introducing into one end of the elongate tube a mass of the curable resin sufficient to impregnate the entire resin absorbent inner layer of the tube,

(2) forming a window in the impermeable outer layer of the tube at a distance from said one end of the tube,

(3) drawing through the window a vacuum in the interior of the tube downstream of said one end by disposing over the window a cup connected by a flexible hose to a vacuum source which cup prevents ingress of air into the interior of the tube while the tube is being evacuated, the outer layer of the tube being substantially impermeable to air,

(4) beginning at or near the end at which the curable resin mass was introduced, passing the tube between squeezing members which force the resin to flow towards the region of vacuum application as the tube progresses through the squeezing members,

(5) when the resin reaches the vicinity of the region of vacuum application, removing the cup and sealing the window,

(6) providing another window in the impermeable layer of the tube downstream of the previously formed window,

(7) drawing through the new window a vacuum in the interior of the tube while progressively moving the tube through the squeezing members to force the resin to flow toward the new region of vacuum application, and

(8) repeating steps 5, 6, and 7, where necessary to impregnate the entire resin absorbent inner layer of the flexible tube.

'012 pat., col. 6, l. 37 - col. 7, l. 6.

USPQ2d 1602. In *Insituform I*, this court interpreted certain limitations of claim 1. Specifically, we held that the literal scope of claim 1 is limited to "a process using only one vacuum cup which inherently creates a discontinuous vacuum." *Insituform I*, 99 F.3d at 1106, 40 USPQ2d at 1608. Under the correct claim construction, we affirmed the district court's JNOV of no literal infringement because the accused Inliner methods use multiple cups or needles. *See id.* at 1107, 40 USPQ2d at 1608. We also concluded that the doctrine of prosecution history estoppel did not preclude Insituform from asserting that its right to exclude extends broadly enough to cover either Process 1 or Process 2, but we did not affirm the district court's finding of infringement under the doctrine of equivalents because it was based on an incorrect claim construction. *See id.* at 1109, 40 USPQ2d at 1610. We therefore vacated the determination of infringement by Processes 1 and 2 under the doctrine of equivalents and remanded the case for the district court to re-determine equivalent infringement applying the correct claim construction. *See id.*

On remand the court determined that both Inliner's Processes 1 and 2 infringed claim 1 of the '012 patent under the doctrine of equivalents. Inliner timely appealed to this court, and the appeal was submitted for our decision following oral argument on July 8, 1998. We have jurisdiction over this appeal pursuant to 28 U.S.C. § 1295(a)(1) (1994).

DISCUSSION

I. Prosecution History Estoppel

Although we held in *Insituform I* that "the prosecution history does not estop Insituform from asserting that the right to exclude extends broadly enough to

cover either Process 1 or Process 2," *Insituform I*, 99 F.3d at 1109, 40 USPQ2d at 1610, Defendants now argue that the district court erred in its determination on remand that "[t]here is nothing in the file history of the '012 patent or the prior art which prevents claim 1 from covering Defendants' processes," *Insituform*, slip op. at 20 (Dec. 31, 1996). According to Defendants, however, the Supreme Court's *Warner-Jenkinson* decision, issued after our remand in *Insituform I*, further limited the doctrine of equivalents so that it cannot apply in this case. *See Warner-Jenkinson Co. v. Hilton-Davis Chem. Co.*, 520 U.S. 17, ——, 117 S. Ct. 1040, 1051, 41 USPQ2d 1865, 1873 (1997) (holding that where no explanation is given for an amendment made during prosecution of a patent, a presumption is to be applied against the patentee that the amendment was made for purposes of patentability). Inliner asserts that when Insituform amended claim 1 in response to a 35 U.S.C. § 103 rejection of application claims 1-6 based on United States Patent No. 4,182,262 to Everson ("Everson"), Insituform necessarily gave up coverage of any process in which the vacuum was created at multiple vacuum sources because it provided no explanation for such a narrowing amendment.

As we discussed in *Insituform I*, however, Everson discloses "both the use of a continuous vacuum and the creation of that vacuum from only a single vacuum source at the far end of the tube opposite the resin source." *Insituform I*, 99 F.3d at 1108, 40 USPQ2d at 1609. Everson discloses nothing about multiple vacuum sources or their placement on the liner close to the resin front. In its response to the PTO rejection, Insituform canceled application claim 1 and filed a new, narrower claim in its place. The new claim, which became patent

claim 1, incorporated each of canceled claims 1, 2, 3, and 4, but otherwise added no new limitations. In its remarks to the PTO, Insituform specifically noted that:

> Everson's method is ineffective when dealing with long lengths of tube because that method requires an exceedingly large suction compressor. Applicant's method solves the problem of impregnating long lengths of tubing by forming a window in the tube's impermeable skin, drawing the resin to the region of the window by a vacuum . . . .

Response to First Office Action, March 30, 1982, p.4. We held, therefore, in *Insituform I*:

> Insituform solved this [Everson] problem by placing the suction source closer to the resin front thus allowing the use of a smaller suction compressor. *Thus, Insituform unequivocally gave up coverage to a process in which a single vacuum source is located at the far end of the tube.*

Id. at 1108, 40 USPQ2d at 1610 (emphasis added). The stated reason, therefore, for Insituform's amendment to overcome the Everson reference was to avoid the need to use a large compressor when the vacuum is created a significant distance from the resin source. *See id.* The *Warner-Jenkinson* presumption, therefore, which comes into play only when *no explanation* is given for a claim amendment, is not applicable to this case because Insituform made clear that the reason for the amendment was to overcome the prior art teaching creation of a single source vacuum at the far end of the liner.

Defendants argue, however, that other statements made in the remarks to the Patent Office warrant limitation of claim 1 by prosecution history estoppel to

a single cup process. Again, we discussed such statements in *Insituform I*:

> in explaining its amendments, Insituform discussed the use of a single vacuum source which was to be moved along the tube as the resin front advanced. This suggests that Insituform envisioned the use of discontinuous vacuum created sequentially by only one vacuum source. However, *this statement alone is too equivocal to be read as a statement which would estop Insituform from equivalently covering a number of small compressors spread along the tube creating a continuous vacuum.*

Id. at 1108, 40 USPQ2d at 1610 (emphasis added). Defendants urge that the above-emphasized statement in *Insituform I* proves that Insituform did not explain why claim 1 was limited, and "[i]n [these] circumstances, prosecution history estoppel [should] bar the application of a doctrine of equivalents as to that element," *Warner-Jenkinson*, 117 S. Ct. at 1051, 41 USPQ2d at 1873.

In these remarks, however, Insituform was simply explaining the use of the claimed method and its statements did not negate the earlier-discussed, clear explanation of the reason for the amendment. Therefore, we hold that Insituform did explain the reason for its changes in claim 1, and those reasons do not prohibit application of the doctrine of equivalents completely, but only with respect to the subject matter surrender of a large, single vacuum source placed a significant distance from the resin front. *See Insituform I*, 99 F.3d at 1109, 40 USPQ2d at 1610. We conclude, as we did in *Insituform I*, that "prosecution history does not estop Insituform from asserting that the right to exclude

extends broadly enough to cover either Process 1 or Process 2." *Id.* *Warner-Jenkinson* changed nothing applicable here. The district court's determination on remand after *Insituform I*, therefore, is affirmed.

II. Infringement Under the Doctrine of Equivalents

Infringement, both literal and under the doctrine of equivalents, is a question of fact which we review for clear error when tried to the court. *See SRI Int'l v. Matsushita Elec. Corp. of Am.*, 775 F.2d 1107, 1125, 227 USPQ 577, 589 (Fed. Cir. 1985) (in banc); *see also Hilton-Davis Chem. Co. v. Warner-Jenkinson Co., Inc.*, 62 F.3d 1512, 1520, 35 USPQ2d 1641, 1657 (Fed. Cir. 1995) (in banc), *rev'd on other grounds*, 117 S. Ct. 1040, 520 U.S. 17, 41 USPQ2d 1865 (1997). "In applying the doctrine of equivalents, it is often enough to assess whether the claimed and accused products or processes included substantially the same function, way, and result." *Hilton-Davis*, 62 F.3d at 1518, 39 USPQ2d at 1645.

A. Process 1

The district court held that Defendants' Process 1, the multiple cup process, infringed claim 1 of the '012 patent under the doctrine of equivalents. Defendants argue, however, that the district court's determination was clearly erroneous because it ignores the substantial differences between the one-cup process of claim 1 and the accused multiple cup process.

Defendants specifically identify three "substantial differences": "[m]ore cups, continuous vacuum, [and] ability to impregnate longer, thicker liners faster, . . . We address each of these differences in turn. First, although claim 1 only claims the method of using one cup

to impregnate the tube with resin, the multiple cups used in the accused process each perform precisely the same steps and functions as the single cup of the claimed method. Every limitation in claim 1, therefore, is met by at least one cup in Defendants' multiple cup process. That all the cups together may not meet every limitation does not necessarily avoid equivalent infringement.

Second, Defendants assert that their multiple cup process draws a vacuum continuously whereas claim 1 inherently draws a vacuum discontinuously. A discontinuous vacuum is not a limitation of claim 1, although it is inherent in the operation of a single cup. In Defendants' accused method, the operation of each cup of the set draws a vacuum discontinuously, at least when it is moved from one location on the tube to another location further downstream of the resin front.

Moreover, the district court found that the use of multiple cups results "in a continuous vacuum which enhances the degree of vacuum achieved at the resin front," but that "there is nonetheless an insubstantial difference between" claim 1 and the multiple-cup process. We discern no clear error in this finding. There was evidence that the degree to which the multiple-cup process enhances the vacuum at the resin front, as compared to the single-cup process, is insubstantial. In particular, there was evidence that, in the claimed single-cup process, the amount of time when no vacuum was applied at the resin front was minimal so there was no substantial effect on the vacuum at that location. Furthermore, there was evidence that, like the single-cup process, the shifting of cups in the multiple-cup process results in a lessening of the vacuum at the resin front.

Third, Defendants argue that their method is more efficient because it can impregnate "longer, thicker liners faster." While Defendants' claim may be true, it is irrelevant because every one of claim 1's limitations is still met, at least equivalently. Hence, it does not matter that Defendants' Process 1 may be better or more efficient. *See Amstar Corp. v. Envirotech Corp.*, 730 F.2d 1476, 1482, 221 USPQ 649, 653 (Fed. Cir. 1984) (quoting *McCullough Tool Co. v. Well Surveys, Inc.*, 343 F.2d 381, 402, 145 USPQ 6, 22 (10th Cir. 1965) ("infringement cannot be avoided by the mere fact that the accused device is more or less efficient or performs additional functions")).

Defendants, therefore, have not identified to us any substantial differences between the accused method and the limitations of the method of claim 1. The district court's determination of infringement of claim 1 by Process 1 under the doctrine of equivalents is therefore affirmed.

B. Process 2

The district court held that there were no substantial differences between Defendants' accused Process 2, the multiple needle process, and the method of claim 1. *Insituform,* slip op. at 18-19. The district court found:

> Both the cup and the tube [needle] are, as claim 1 states, "connected by a flexible hose to a vacuum source", both are the means provided for the application of vacuum, they both do the same thing (suck a vacuum) by the same means (being connected to a vacuum source) to achieve the same result (produce a satisfactory vacuum at the resin front).

Id. at 19. From this analysis it appears that the district court determined the "function" of the cup to be to "suck a vacuum," the "way" to be by "being connected to a vacuum source," and the "result" to be to "produce a satisfactory vacuum at the resin front." Defendants assert on appeal that the court's function-way-result analysis is fatally flawed because it describes Everson. Although not clear to us that the district court's function-way-result analysis for the cup limitation would encompass the Everson patent, we nevertheless hold that the district court's function-way-result analysis involves too much overlapping and is overly broad. Specifically, the district court's identification of the limitation's "function" merges with the "way" and the "result": to provide a vacuum, to be connected to a vacuum source, and to produce a satisfactory vacuum at the resin front all define basically the same thing.

Under the proper "way" part of the function-way-result analysis, the "way" the cup provides a vacuum is by being disposed over a "window" cut in the outer, plastic liner of the tube and pressed on top of the exposed felt layer and being connected at the other end to a vacuum source. By contrast, the "way" Process 2 needles provide a vacuum is by being inserted through multiple punctures into the center of the tube (through the felt layer) and being connected at their other ends to a vacuum source. The question then becomes: are these two "ways" equivalent, or did the district court clearly err in holding that Defendant's Process 2 infringed claim 1 under the doctrine of equivalents? Defendants assert that the distinction between the cup and the needle is substantial, and the fact that the district court dismissed this distinction as "irrelevant" under the equivalents analysis is fatal.

Another factor that affects our equivalent infringement analysis is that the inventor of the '012 patent attempted to use a needle instead of a cup prior to filing his application. For a reason that is disputed by the parties, he changed to a cup, and when his patent application was filed, no mention of the possible use of a needle was made. Insituform argues that the inventor's early use of needles shows that needles are old in the art and are known substitutions for cups. Defendants argue, however, that the inventor's "failure" with needles is evidence of a substantial difference between needles and cups. It is not apparent from the district court's opinion that it considered this prior attempt with needles. The evidence that the inventor first tried to use needles and then changed to cups without disclosing to the public that needles were, indeed, an option, supports an inference that the inventor was unable satisfactorily to practice his claimed method using a needle instead of a cup.

We therefore hold that, based on the evidence of substantial differences between the claimed single cup process and the accused multiple needle process, and the district court's legal errors in defining incorrectly the "way" in its function-way-result analysis and dismissing structural differences as irrelevant, the district court reversibly erred in finding that Defendants' multiple needle process infringed Insituform's claim 1 under the doctrine of equivalents. Once the "way" is correctly defined and the structural differences are properly considered, no reasonable trier of fact could have found the claimed single cup process and the accused multiple needle process to be equivalent.

III. District Court's Refusal to Consider New Evidence

Prior to remand, this case had been tried twice on the issue of equivalent infringement, once to a jury and a second time to the court. Defendants now argue that the district court erred reversibly in refusing on remand to consider their new evidence of lack of equivalent infringement. We review the district court's refusal to allow Defendants to supplement the record on remand for abuse of discretion. *See Westvaco Corp. v. International Paper Co.*, 991 F.2d 735, 745, 26 USPQ2d 1353, 1362 (Fed. Cir. 1993) (applying regional circuit law); *Rollins v. Fort Bend Indep. School Dist.*, 89 F.3d 1205, 1220 (5th Cir. 1996) (abuse of discretion standard).

Defendants assert that this "new" evidence showed, *inter alia*, the substantiality of the differences between the accused processes and method claim 1, and that Insituform witnesses had "not been truthful during testimony taken at the 1995 trial." Further, asserts Defendants, this court on remand gave the district court a "directive" to make new findings in accordance with the corrected claim construction, presumably necessitating at least the submission of further evidence.

We are unpersuaded, however, that the reasons cited by Defendants for the district court to accept supplemental evidence "mandate" its acceptance. First, our reversal today of the district court's finding of equivalent infringement of the multiple needle process shows that sufficient evidence was already present in the record based upon which the district court could have correctly decided the issue without submission of new evidence. Nor have Defendants shown that the evidence could not have been found and submitted at the first trial. Second, a review of the relevant language in

Insituform I does not reveal a "mandate" for further, broader fact-finding by the district court. We therefore conclude that the district court did not abuse its discretion on remand in refusing to admit Defendants' supplemental evidence.

IV. Liability of KM

Defendants assert that the district court committed reversible error in holding that KM induced infringement of the '012 patent. This issue was decided by the district court in 1995 and appealed to this court. Insituform argues that we considered this issue already in *Insituform I*, and that, therefore, it is the law of the case. We disagree. In *Insituform I*, we did not reach this issue because we vacated the district court's finding of direct infringement. *See Met-Coil Sys. Corp. v. Korners Unlimited, Inc.*, 803 F.2d 684, 687 (Fed. Cir. 1987) (Liability for inducement under § 271(b) is dependent on showing that the conduct being induced constitutes direct infringement.).

Defendants argue, *inter alia*, that the evidence fails to show that KM induced infringement of the '012 patent because the district court found, and Insituform does not dispute, that KM did not know of the existence of the '012 patent until after Insituform filed its complaint on February 2, 1990. Thus, Defendants assert, KM's acts cannot establish liability for inducing infringement of the '012 patent, because all accused acts by KM occurred before KM knew of the patent. A crucial element of induced infringement is that the inducer must have actual or constructive knowledge of the patent. A separate corporation related to KM licensed the infringing technology to Inliner after KM received notice of the '012 patent. The separate corporation is not a party to

this case, and there were no findings that this affiliate was KM's alter ego. We agree that Defendants have shown clear error on the district court's finding that KM induced infringement. As the trial court made no finding on the alter ego issue, instead of reversing, we vacate the district court's holding and remand as to that issue.

V. Liability of MSC

Defendants assert that the district court committed reversible error in holding MSC fully liable as the other defendants. Defendants argue that MSC's sole contribution to the joint venture was to provide financing, if necessary, and bonding. Defendants argue that "[d]uring trial in 1995, Inliner moved for JMOL on this issue," and the district court denied the motion. Defendants, however, did not raise this issue in *Insituform I*; and therefore, it is not properly before the court today. Because Defendants did not properly appeal this issue after the 1995 decision, it has been waived. Moreover, as Insituform asserts in response, the bifurcated damages trial will determine for what amount MSC is actually responsible, which may be less than for other defendants.

CONCLUSION

Because Defendants did not demonstrate clear error by the district court in its finding that Process 1 equivalently infringed claim 1 of the '012 patent, we affirm with respect to Process 1. With respect to Process 2, however, we hold that the district court did clearly err in finding that Defendants infringed and legally erred in its methodology; and therefore, we reverse. We further hold that the district court clearly erred in finding that KM induced infringement, and we vacate its holding and remand as to this issue. We do not review the

district court's determinations of liability for MSC as that issue is not properly before us. The decision, therefore, is

AFFIRMED-IN PART AND REVERSED-IN-PART.

COSTS

Each party shall bear its own costs.

APPENDIX C

United States Court of Appeals for the Federal Circuit

96-1078, -1099

INSITUFORM TECHNOLOGIES, INC., INSITUFORM (NETHERLANDS) B.V. and INSITUFORM GULF SOUTH, INC.,
Plaintiffs-Cross/Appellants,
v.
CAT CONTRACTING, INC., MICHIGAN SEWER CONSTRUCTION, KANAL SANIERUNG HANS MUELLER GmbH & CO. KG and INLINER U.S.A.,
Defendants-Appellants.

Decided: November 5, 1996

Before ARCHER, *Chief Judge*, MICHEL, and SCHALL, *Circuit Judges*.

MICHEL, *Circuit Judge*.

Inliner[1] appeals from the district court's order denying its motion for post-verdict judgment notwithstanding the verdict ("JNOV")[2] of invalidity of United States Patent No. 4,336,012 ("the '012 patent"), the district court's order denying its motion to amend certain coun-

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[1] "Inliner" is a collective reference to four separate defendants: Cat Contracting, Inc.; Michigan Sewer Construction Co.; Kanal Sanierung Hans Mueller GmbH & Co. KG; and Inliner U.S.A.

[2] A JNOV is now known as a judgment as a matter of law ("JMOL"). As JNOV was the proper terminology used at the time Inliner filed its motion, we will use it throughout this opinion.

terclaims, and the district court's final decision finding infringement under the doctrine of equivalents. Insituform[3] cross-appeals from the district court's order granting Inliner's motion for post-verdict JNOV of no literal infringement of claim 1 of the '012 patent. The case was submitted for decision after oral argument on July 10, 1996. We affirm in all respects, except one: we vacate the finding of infringement under the doctrine of equivalents and remand to redetermine infringement under the doctrine because, although the prosecution history of the '012 patent does not estop Insituform from claiming that the accused processes infringe, the district court's doctrine of equivalents infringement analysis was tainted by the use of an incorrect claim construction.

The appeal and cross-appeal at bar arise from a complex series of trials spanning five years in the U.S. District Court for the Southern District of Texas, Case No. H-90-1690. In February 1990, Insituform brought suit against Inliner, alleging infringement of the '012 patent. Inliner filed an answer, as well as counterclaims for a declaratory judgment of noninfringement, invalidity, and unenforceability of the '012 patent. Inliner also filed a counterclaim for tortious interference with contractual relations which included the assertion that "Insituform has successfully monopolized the market for soft-lining sewer rehabilitation in the United States for many years." The counterclaim did not, however, refer to the federal antitrust laws, nor was there a separate counterclaim alleging antitrust violations.

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[3] "Insituform" is a collective reference to three separate plaintiffs: Insituform Technologies, Inc.; Insituform (Netherlands) B.V.; and Insituform Gulf South, Inc.

On March 5, 1991, almost a year after Insituform had filed its answer and counterclaims, the district court filed an order indicating that, *inter alia*, "defendants' counterclaim for antitrust violations is severed."[4] Shortly thereafter, Inliner entered a motion to amend its counterclaims so as "to include specific allegations regarding Insituform's antitrust violations." The district court did not take any immediate action on Inliner's motion.

In June 1991, the patent and state law issues in the case were tried to a jury for two weeks. At the close of the trial, the jury returned verdicts of infringement, no invalidity, no inequitable conduct, and no tortious interference with contract. Although the jury was instructed on both literal infringement and infringement under the doctrine of equivalents, the interrogatory form asked only whether "Inliner made, used, or sold a method that infringes claim one of the '012 patent," *i.e.*, for a general infringement verdict. Inliner moved for JNOV on all issues. By order dated August 28, 1991, the court granted the JNOV motion in part, concluding that Inliner had not literally infringed the '012 patent and that it was entitled to retrial on the question of infringement under the doctrine of equivalents. The court denied Inliner's motion with respect to the jury's verdict of no invalidity, thus leaving that verdict intact.

In February 1995, the claim of infringement under the doctrine of equivalents was retried, this time to the bench, for three days.[5] On October 11, 1995, the district

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[4] Because no such counterclaim existed, the court's order is difficult to comprehend as anything other than a mistake.

[5] In 1995, the case was reassigned from Judge Hughes, who had presided over the first trial, to Judge Gilmore, who tried the question of infringement under the doctrine of equivalents.

court denied Inliner's motion to amend its allegedly severed counterclaims. In November 1995, the district court entered amended findings of fact and conclusions of law, according to which two of Inliner's processes were found to have infringed under the doctrine. At that time, the court also explained that its earlier reference to the severance of an antitrust counterclaim had been "erroneous[]," inasmuch as no such counterclaim had ever existed.

Inliner appeals from the district court's (1) August 28, 1991 order denying its motion for post-verdict JNOV of invalidity of the '012 patent, (2) October 11, 1995 order denying its motion to amend the counterclaims, and (3) final decision finding infringement under the doctrine of equivalents despite Inliner's alleged prosecution history estoppel defense. Insituform cross-appeals from the district court's August 28, 1991 order granting Inliner's motion for post-verdict JNOV of no literal infringement of claim 1 of the '012 patent.

We write solely on the questions of infringement, both literal and by equivalency, of the '012 patent. Of the issues raised by the parties, only these infringement issues merit extended analysis. The jury's rejection of Inliner's attack on the validity of the '012 patent is amply supported by the evidence, and we discern no error in the district court's denial of Inliner's motion for post-verdict JNOV on this point. The district court's eventual denial of Inliner's 1991 motion to amend its "antitrust" counterclaim was not, as Inliner contends, an abuse of discretion, inasmuch as no "antitrust" counterclaim in need of amending ever existed. The district court's decisions on these two points are straightforward, and we affirm them without further discussion. Because the district court's grant of Inliner's motion for

post-verdict JNOV of no literal infringement is consistent with the proper construction of claim 1 of the '012 patent, we affirm that grant. Although the district court properly determined that the prosecution history of the '012 patent did not estop Insituform from claiming infringement by the accused processes under the doctrine of equivalents, we vacate the district court's decision that Inliner infringed under the doctrine in light of Judge Gilmore's reliance on a claim construction that is incorrect as a matter of law.

BACKGROUND

The Technology

Underground pipes, such as sewer pipes, are subjected to great stress. As a result, over time, the pipes develop cracks and other structural defects. Before the development of the technology involved in the case at bar, the only way to rehabilitate a section of underground pipe was to dig up the broken portion and replace it.

Eric Wood, an inventor at Insituform, pioneered a process for rehabilitating a sewer or other underground pipe without digging it up. Specifically, in the process developed by Wood, one inverts within the pipe a flexible tubular liner comprising an impermeable plastic layer and a thick, resin-impregnated felt layer, such that the resin-impregnated felt layer is held against the inner wall of the pipe. The resin used to impregnate the felt is thermosetting; in other words, although soft while at "room" temperature, the resin hardens permanently when exposed to heat. After the tubular liner has been put in place – plastic layer facing in, felt side facing out – and pressed out to conform to the pipe under repair,

hot water is pumped through the lining to harden the resin.

Early in the development of this technology, artisans learned that they could facilitate the impregnation process, as well as make the resulting impregnation more thorough, by drawing air from the interior of the felt tube during impregnation. In general, the processes at issue in the case at bar all involve (a) a tube of felt with an impermeable outer layer, (b) into which is placed a "slug" of resin large enough to impregnate fully that length of tubing, (c) after which the tube is drawn through squeezing rollers, (d) while a vacuum is drawn through at least one opening somewhere downstream of the "resin front."

The Everson Prior Art Patent

U.S. Patent No. 4,182,262 to Everson ("the Everson patent") issued in January 1980. It teaches both an apparatus and method for impregnating the felt lining of a flexible tube with resin *at the repair site*, thus eliminating the need to transport heavier, already-impregnated tubing to the site. Col. 1, ll. 15-63. The preferred embodiment includes a vacuum pump that is attached, by means of a hose, to the far end of the length of tubing to be impregnated. Col. 6, l. 65 - Col. 7, l. 8. The specification describes the drawing of the vacuum during impregnation as follows:

> As the tube passes through the throat [between the conveyor belt and the first roller], it is flattened therein and the resin in the bulge is spread transversely of the frame from side to side within the tube. As the conveyor transports the tube through the apparatus, the tube passes through the flat-

> tener commencing at the leading end so that the resin is extruded along the tube toward said opposite end. When the tube is engaged in the throat, the motor driving the vacuum pump is energized, creating a negative pressure in the reservoir, the hose, and the end of the tube opposite the leading end. The impervious outer lamina [of the tube] minimizes intrusion of air into the tube so that an effective vacuum can be maintained. The negative pressure urges the fluid resin to flow within the tube toward said opposite end. The combined action of the flattener and the vacuum system thus cause[s] the resin thoroughly to impregnate the absorbent lamina of the length of the tube required to line the passageway.

Col. 9, ll. 1-19 (diagram reference numbers omitted).

Claim 1 of the Everson patent recites an apparatus corresponding to the preferred embodiment in "means plus function" terms. Claim 2 recites "[t]he apparatus of claim 1 having a source of vacuum connected to the end of the tube opposite said leading end thereof, whereby the fluid material is urged to flow within the tube toward said end thereof opposite to the leading end." Col. 10, ll. 40-44. Claim 3, like claim 1, recites an apparatus, but includes a limitation reciting "vacuum means communicating with the [far] end of [the] tube" to be impregnated. Col. 10, ll. 52-53.

In short, Everson teaches attaching the vacuum to the tube to be impregnated at only *one* place–the end opposite the resin-containing leading end–and applying that vacuum *continuously* throughout the impregnation process.

The Patent in Suit

Eric Wood filed the application that matured into the '012 patent in February 1981.[6] The only prior art reference Wood cited was the Everson patent. The application included the following description of an innovative manner of applying a vacuum, or negative pressure, to the tube:

> The vacuum may be applied through a window in the film in the wall of the tube by means of a cup applied to said window and connected to a source of vacuum by means of a flexible hose, whereby the cup can move with the tube during its movement relative to said nip. As each section of the tube has its resin absorbent material thus impregnated with resin, the cup may be moved and applied to a position spaced downstream from the previous window, the said previous window being sealed by means of a patch or the like, whereby the process is repeated for respective lengths of the tube until the entire tube length has been impregnated.

Later, in connection with describing the drawings accompanying the application, Wood offered the following account of applying the vacuum cup to the tube:

> A vacuum source is provided, and a vacuum cup is connected to the vacuum source by means of a flexible hose. The vacuum cup is applied to the outside of the lining tube, downstream of the mass of resin inside the tube . . . the vacuum cup being in register with a window made in the outer mem-

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[6] Insituform (Netherlands) B.V. is the owner of the '012 patent. Insituform Technologies, Inc. is the exclusive licensee and has granted a sublicense to Insituform Gulf South, Inc.

> brane of the lining tube, so that the vacuum applied to the interior of the cup can be applied to the interior of the lining tube, whereby air is drawn from the inside of the tube to permit the effective and efficient impregnation of the absorbent material with the resin. . . .
>
> Fig. 11 shows the impregnation process at a midway position, and it should be mentioned that when one section of the impregnation of the tube has been completed, the suction cup is removed to a downstream location whereat a further window is formed, the previous window having been sealed by means of a patch of a material compatible to the material of the coating, the patch being suitably sealingly bonded to the coating material. The vacuum cup is therefore applied at intervals during the impregnation process, until complete impregnation of the resin absorbent material has been achieved.

(Diagram reference numbers omitted).

As initially filed, the Wood application contained nine claims, only four of which are relevant to this appeal. The original four claims with relevance to this dispute are as follows:

> 1. A method of impregnating a flexible tube comprising an inner layer of resin absorbent material and an outer layer in the form of an impermeable film, wherein the resin absorbent layer is impregnated with a curable resin by applying a vacuum to the inside of a flexible tube whilst the resin is brought into impregnation contact with the resin absorbent material, the impermeable film serving as a means to prevent ingress of air into the interior

of the tube, whilst the impregnation process is taking place.

2. A method according to claim 1, wherein the resin is introduced into one end of the tube in a quantity calculated effectively to impregnate all of the resin absorbent material of the tube, and the vacuum is applied to the interior of the tube, downstream of the resin mass, so that the resin will tend to flow towards the vacuum application region.

3. A method according tc claim 2, wherein the lining tube containing the mass of resin is fed through a pressure applying nip, such as may be defined by a nip roller, which, together with the movement of the tube, squeezes the resin in a direction towards the region of the application of the vacuum, at the same time flattening the tube and assisting in the even distribution of the resin.

4. A method according to claim 2, wherein the vacuum is applied through a window in the film in the wall of the tube by means of a cup applied to said window and connected to a source of vacuum by means of a flexible hose, whereby the cup can move with the tube during its movement relative to said nip, the cup being moved and applied to a position spaced downstream from the previous window, said previous window being sealed by means of a patch or the like, whereby the process is repeated for respective lengths of the tube until the entire tube length has been impregnated.

The examiner rejected these claims in light of the Everson patent, specifically stating that "[c]laims 1-6 are rejected under 35 USC 103 as unpatentable over Everson et al. The claimed process does not appear to

differ in any unobvious aspect from that of the reference." In response, Wood canceled the original claims and submitted three new claims that recited in new form the limitations of original claims 4 through 6. In so doing, Wood submitted the following argument:

> The principal reference relied on in the rejection of claims 1 to 6 is the patent to Everson (U.S. 4,182,262). Everson's method is ineffective when dealing with long lengths of tube because that method requires an exceedingly large suction compressor. Applicant's method solves the problem of impregnating long lengths of tubing by forming a window in the tube's impermeable skin, drawing the resin to the region of the window by a vacuum while squeezing the tube to force the resin to flow toward the evacuated region, sealing the window, and repeating the process at another window farther downstream. Thus by iterating and reiterating that process, the resin is drawn along to impregnate the entire length of the tube.
>
> It is submitted that applicant has taught an improvement upon Everson's method which makes feasible the impregnation of long tube lengths and that the grant of a patent on that improvement is merited.

The examiner then allowed the claims without further argument or comment and the '012 patent issued on December 28, 1982. Claim 1, the only claim in suit, is as follows:

> 1. A method of impregnating with a curable resin an inner layer of resin absorbent material disposed in an elongate flexible tube having an

outer layer formed by an impremeable [sic] film, the method comprising the steps of

(1) introducing into one end of the elongate tube a mass of the curable resin sufficient to impregnate the entire resin absorbent inner layer of the tube,

(2) forming a window in the impermeable outer layer of the tube at a distance from said one end of the tube,

(3) drawing through the window a vacuum in the interior of the tube downstream of said one end by disposing over the window a cup connected by a flexible hose to a vacuum source which cup prevents ingress of air into the interior of the tube while the tube is being evacuated, the outer layer of the tube being substantially impermeable to air,

(4) beginning at or near the end at which the curable resin mass was introduced, passing the tube between squeezing members which force the resin to flow towards the region of vacuum application as the tube progresses through the squeezing members,

(5) when the resin reaches the vicinity of the region of vacuum application, removing the cup and sealing the window,

(6) providing another window in the impermeable layer of the tube downstream of the previously formed window,

(7) drawing through the new window a vacuum in the interior of the tube while progressively

moving the tube through the squeezing members to force the resin to flow toward the new region of vacuum application, and

(8) repeating steps 5, 6, and 7, where necessary to impregnate the entire resin absorbent inner layer of the flexible tube.

Col. 6, l. 37 - Col. 7, l. 6.

The Accused Process

Inliner engages in two processes which are at issue here. Both processes result in continuous vacuums.

In "Process 1" or "the Multiple Cup Process," from four to six cups are used to draw a vacuum from a corresponding number of slits in the tube. As a result, when the cup closest to the advancing resin is removed, and the slit beneath it sealed, the remaining downstream cups continue to draw a vacuum in the tube.

In "Process 2" or "the Multiple Needle Process," the multiple cups are replaced by multiple metal tubes. The metal tubes, known as needles, are inserted through the layers of the impregnated tube, rather than merely placed over holes in the wall of the impregnated tube. Inliner did not develop Process 2 until 1991, after the first phase of the case had already been tried to a jury.

ANALYSIS

Literal Infringement

Insituform cross-appeals from the district court's grant of Inliner's motion for JNOV of no literal infringement. According to Insituform, JNOV was improper because "*[e]ach* of defendants' [vacuum] cups 1, 2, 3, etc. is

manipulated precisely as called for in the claim, thus constituting multiple infringements."

We review *de novo* the correctness of a grant of a JNOV by reapplying the JNOV standard. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 975, 34 USPQ2d 1321, 1326 (Fed. Cir. 1995) (in banc), *aff'd*, 116 S. Ct. 1384 (1996). Thus, as the district court was required to do upon Inliner's motion for JNOV, we

> must determine whether there exists evidence of record upon which a jury might properly have returned a verdict in [the non-movant's] favor when *the correct legal standard is applied.* If there is not, [the movant] was entitled to have the question removed from the jury and decided as a matter of law.

Markman, 52 F.3d at 975, 34 USPQ2d at 1326 (quoting *Jamesbury Corp. v. Litton Indus. Prods., Inc.*, 756 F.2d 1556, 1560, 225 USPQ 253, 257 (Fed. Cir. 1985)). In so determining, we must uphold factual findings made by the jury unless there is a lack of substantial evidence to support a finding in favor of the nonmovant. *Id.* On the other hand, we must consider *de novo* whether the legal standards applied by the jury are correct as a matter of law. *Id.*

Here, we are asked to determine whether there is substantial evidence to support the jury's finding that Inliner literally infringed Insituform's patent. An infringement analysis consists of two steps: interpreting the claims in a patent to determine their scope and meaning and comparing the properly construed claims to the accused product or process. *Id.* at 976, 34 USPQ2d at 1326.

Here, the entire analysis turns on the proper claim construction. That is because the underlying issue of claim construction is whether claim 1 should be construed to be literally limited to a process using one and only one vacuum cup, as asserted by Inliner. If so limited, the claim is also inherently limited to a process where the drawing of the vacuum inside the tube is discontinuous, *i.e.*, interrupted by the moving of the cup from window to window. Such a claim cannot be infringed by Process 1, because that process maintains a continuous vacuum.

Claim construction is a question of law which we review *de novo*. *Id.* at 979, 34 USPQ2d at 1329. In construing claim 1, we look first to the intrinsic evidence of record, namely the language of the claim, the specification and the prosecution history. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582, 39 USPQ2d 1573, 1576 (Fed. Cir. 1996). Looking first to the claim language, we note preliminarily that Insituform has conceded that claim 1 contains no terms that have a specialized or technical meaning. Furthermore, nothing in the text of claim 1 suggests the use of more than one cup. Specifically, claim 1 refers to "a cup" and "the cup" repeatedly, suggesting that only one cup is involved. Indeed, rather than describing the process in terms of more than one cup, claim 1 specifically describes using the same cup repeatedly. Also, claim 1 uses the phrase "region of vacuum application" in a manner indicating that only one such region exists at any given time. This use of the phrase "region of vacuum application" is thus inconsistent with the use of more than one cup at any given time, as each cup creates its own associated region of vacuum application. Likewise, it is also inconsistent with the creation of a continuous,

rather than discontinuous, vacuum.

Turning to the text of the specification, we note that neither the specification nor the drawings disclose the use of more than one cup. For example, the specification states:

> The vacuum may be applied through *a window* in the film in the wall of the tube by means of *a cup* applied to said window . . . whereby *the cup* can move with the tube . . . . As each section of the tube has its resin absorbent material thus impregnated with resin, *the cup* may be moved and applied to a position spaced downstream from the previous window . . . .
>
> Col. 2, ll. 30-35 (emphasis added).
>
> A vacuum source is provided, and *a vacuum cup* is connected to the vacuum source by means of a flexible hose. *The vacuum cup* is applied to the outside of the lining tube downstream of the mass of resin inside the tube . . . .
>
> Col. 5, ll. 61-65 (emphasis added, diagram reference numbers omitted).
>
> [W]hen one section of the impregnation of the tube has been completed, *the suction cup* is removed to a downstream location . . . . *The vacuum cup* is therefore applied at intervals during the impregnation process, until complete impregnation of the resin absorbent material has been achieved.
>
> Col. 6, l. 14-24 (emphasis added, diagram reference numbers omitted).

Likewise, the drawings of the '012 patent, specifically figures 10 and 11, show only a single vacuum cup.[7]

In light of the language found in the claims, specification and file history, we conclude the only correct and indeed the reasonable interpretation of claim 1 limits the scope of that claim to a process using only one vacuum cup which inherently creates a discontinuous vacuum. Indeed, as Insituform concedes in its brief, "[t]here is no question but that the patent discloses a single vacuum cup which draws a vacuum at one point and then, when the resin front approaches, is removed from its initial position and repositioned to draw vacuum at its new downstream position." Thus, in light of the fact that Inliner's processes both create a continuous vacuum, neither can literally infringe.

Insituform argues that such an interpretation places too much weight on the distinction between drawing a vacuum and the evacuated state that exists within the tube, even as a cup is moved from one window to another. According to Insituform, "it is not the continuity of *drawing* the vacuum which is important but rather the continuity of *having* an effective vacuum where the resin meets the portion of the felt to be impregnated." However, such attorney argument cannot control in light of the language of the claim. Claim 1, and more specifically steps 3 and 7, is cast in terms of "drawing a vacuum," not merely having a vacuum.

Insituform also argues that claim 1 requires only "manipulating the suction cup (or its equivalent) in a

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[7] Although Insituform's own witnesses confirmed this interpretation of the claim, we need not give such testimony any weight, as the intrinsic evidence alone is sufficient to resolve any ambiguity in the claim. *See Vitronics*, 90 F.3d at 1584, 39 USPQ2d at 1578.

particular fashion," that each of the cups used in Process 1 is manipulated in such a fashion, and that "adding something to an infringement [*i.e.,* more than one cup] does not avoid infringement." However, as discussed above, we believe that claim 1 must be construed as reading only on a one cup, discontinuous vacuum process. While adding elements may, in certain instances, fail to prevent a finding of infringement, it will prevent a finding of literal infringement where, as here, the claim is specific as to the number of elements (one cup) and adding elements eliminates an inherent feature (discontinuous vacuum) of the claim.

In light of our conclusion that claim 1 must be construed to literally cover a process using only one cup, and thereby literally cover only a process using a discontinuous vacuum, and the complete lack of evidence indicating Inliner's Process 1 uses only a single cup, there was no evidence upon which the jury could have reasonably returned a verdict in Insituform's favor when applying the correct claim construction, and the district court's grant of JNOV was proper. We therefore affirm the district court's JNOV of no literal infringement.

Infringement Under the Doctrine of Equivalents

Although we conclude the district court correctly granted JNOV in favor of Inliner on the issue of literal infringement, that does not end our analysis. Infringement may still be established under the doctrine of equivalents if there is "proof of insubstantial differences between the claimed and the accused products or processes." *Hilton Davis Chem. Co. v. Warner-Jenkinson Co., Inc.*, 62 F.3d 1512, 1522, 35 USPQ2d 1641, 1648 (Fed. Cir. 1995) (in banc), *cert. granted*, 116 S. Ct. 1014

(1996). This determination is a question of fact and, when made by the trial court, reviewable for clear error. *Hilton Davis,* 62 F.3d at 1521, 35 USPQ2d at 1647.

The doctrine of equivalents, however, is subject to the doctrine of prosecution history estoppel, which acts to limit infringement by otherwise equivalent products or processes. *Pall Corp. v. Micron Separations, Inc.,* 66 F.3d 1211, 1218, 36 USPQ2d 1225, 1230 (Fed. Cir. 1995). Prosecution history estoppel bars the patentee from recapturing subject matter that was surrendered by the patentee during prosecution in order to promote allowance of the claims. *Mark I Mktg. Corp. v. R.R. Donnelley & Sons*, 66 F.3d 285, 291, 36 USPQ2d 1095, 1099-1100 (Fed. Cir. 1995), *cert. denied*, 116 S. Ct. 917 (1996); *Pall Corp.*, 66 F.3d at 1211, 36 USPQ2d at 1230. The application of prosecution history estoppel is a question of law subject to *de novo* review. *See Mark I*, 66 F.3d at 291, 36 USPQ2d at 1100.

The district court held that Process 1 and Process 2 did not differ substantially from the process disclosed in the '012 patent. In so holding, the district court rejected Inliner's prosecution history estoppel argument stating,

> There is nothing in the file history of the '012 patent or the prior art which prevents claim 1 from covering Defendants' processes. The patentee originally claimed, in claim 1, all types of vacuum application, and in claim 4 he originally claimed the sequential application of vacuum. The prior art cited by the Examiner did not show that sequential vacuum application, and by amending the claims, the patentee abandoned protection broad enough to include all types of vacuum application but properly

> retained claims to sequential vacuum application, which is precisely what Defendants do in all of their processes.

Inliner contends that Insituform is precluded by "classical prosecution history estoppel" from asserting that the right to exclude extends broadly enough to cover Inliner's Process 1 or Process 2. According to Inliner,

> During the prosecution of the '012 patent application, Mr. Wood attempted to obtain broad claim coverage covering all vacuum application methods, whether the drawing of a vacuum was continuous or discontinuous. . . . Mr. Wood abandoned this broad coverage and settled for significantly less, claims limited to a single cup, inherently interrupted drawing of vacuum.... Therefore, Insituform is now estopped to assert a range of equivalents that was disclaimed during prosecution. Specifically, Insituform is estopped from covering a method that continuously draws vacuum from the liner.

We do not agree with Inliner's contentions.

In examining the prosecution history in an estoppel analysis, we do not look to the subjective intent of the applicant and what the applicant subjectively believed or intended that he or she was giving up to the public.[8]

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[8] This is not to say that we do not examine the purpose of the statements made to the PTO. Thus, for example, "a concession made or position taken to establish patentability in view of prior art on which the examiner has relied, is a substantive position on the technology for which a patent is sought." *Pall Corp.*, 66 F.3d at 1220, 36 USPQ2d at 1231. On the other hand, "when claim changes or arguments are made in order to more particularly point out the applicant's invention [*e.g.*, in response to a rejection under 35 U.S.C. § 112] , the purpose is to impart precision, not to overcome prior art." *Id.*

Rather, the standard for determining what subject matter was surrendered is objective and depends on what a competitor, reading the prosecution history, would reasonably conclude was given up by the applicant. *Mark I*, 66 F.3d at 291, 36 USPQ2d at 1100; *see also Haynes Int'l, Inc. v. Jessop Steel Co.*, 8 F.3d 1573, 1578, 28 USPQ2d 1652, 1656 (Fed. Cir. 1993) ("The legal standard for determining what subjective matter was relinquished is an objective one, measured from the vantage point of what a competitor was reasonably entitled to conclude, from the prosecution history, that the applicant gave up to procure issuance of the patent."); *Prodyne Enter., Inc. v. Julie Pomerantz*, 743 F.2d 1581, 1583, 223 USPQ 477, 478 (Fed. Cir. 1984) ("Prodyne is *estopped* from now broadening the description of a claim element limited during prosecution so as to encompass a structure which a competitor should reasonably be entitled to believe is not within the legal boundaries of the patent claims in suit.").

As noted above, the Insituform application originally contained four claims relevant to the instant dispute. Original claims 1 and 2 were broadly drafted and would likely have read on a process using a single cup or a single needle at any location downstream of the resin, multiple cups or multiple needles at any location downstream of the resin, or continuous vacuum or discontinuous vacuum created at any location downstream of the resin. Claim 3 was also drafted broadly and would have likely read on both continuous vacuum or discontinuous vacuum created at any point along the tube downstream of the resin. Original claim 4 was the narrowest. The claims were rejected over Everson, which discloses both the use of a continuous vacuum and the creation of that vacuum from only a single

vacuum source at the far end of the tube opposite the resin source.

In response, Insituform canceled the claims and filed new, narrower claims, including what is now claim 1, which, as we held above, is literally limited to the use of one vacuum cup which inherently creates a discontinuous vacuum. However, in its statement to the PTO, Insituform specifically noted that the problem with Everson was that "Everson's method is ineffective when dealing with long lengths of tube because that method requires an exceedingly large suction compressor." The need for an exceedingly large suction compressor occurred because the Everson suction compressor was located at the far end of the tubing. Insituform solved this problem by placing the suction source closer to the resin front, thus allowing the use of a smaller suction compressor. Thus, Insituform unequivocally gave up coverage to a process in which a single vacuum source is located at the far end of the tube.

It is true that, in explaining its amendments, Insituform discussed the use of a single vacuum source which was to be moved along the tube as the resin front advanced. This suggests that Insituform envisioned the use of a discontinuous vacuum created sequentially by only one vacuum source. However, this statement alone is too equivocal to be read as a statement which would estop Insituform from equivalently covering a number of small compressors spread along the tube creating a continuous vacuum. The prosecution history makes clear that the problem to be solved was the need for a large compressor when the vacuum was created a significant distance from the resin source. The use of one vacuum source repeatedly moved down the tube as the resin advances and the use of a number of vacuum

sources spread along the tube so that one is always near the advancing resin both solve the problem presented by Everson by placing the vacuum source close to the resin, thereby allowing the use of a smaller vacuum source.

Although a patentee's "unmistakable assertions" to the PTO in support of patentability will estop the patentee from obtaining coverage over surrendered material, *Althletic Alternatives, Inc. v. Prince Mfg., Inc.*, 73 F.3d 1573, 1582, 37 USPQ2d 1365, 1373 (Fed. Cir. 1996) (citing *Kinzenbaw v. Deere & Co.*, 741 F.2d 383, 389, 222 USPQ 929, 933 (Fed. Cir. 1984)), here, however, it cannot be said that a reasonable competitor could conclude that Insituform relinquished coverage of processes using either multiple vacuum sources or a continuous vacuum. At no point did Insituform indicate that the Everson problem could be solved only in the manner used by Insituform, *i.e.*, Insituform never stated that the problem could not be solved by using more than one vacuum source or a continuous vacuum. Rather, the only express limitation put on the invention by Insituform was the use of a vacuum source close to the resin. Thus, in light of the equivocal nature of Insituform's statements, no reasonable competitor could conclude that Insituform gave up coverage of continuous vacuum created by one or more vacuum sources. We therefore conclude that the prosecution history does not estop Insituform from asserting that the right to exclude extends broadly enough to cover either Process 1 or Process 2.

We cannot, however, uphold the district court's finding of infringement under the doctrine of equivalents because it is based on an incorrect claim construction. Although Judge Hughes used the correct claim construction in concluding that Inliner had not literally

infringed, Judge Gilmore appears to have applied a different and incorrect claim construction in concluding that there was no infringement under the doctrine. Specifically, in reaching her decision regarding this issue, Judge Gilmore noted that: (1) "[n]owhere in the claim is the licensee restricted to the use of one cup"; (2) the claim was silent regarding "whether the vacuum in the liner is continuous or not"; and (3) the vacuum in the patented invention is continuous. Thus, as the district court's doctrine of equivalents analysis was distorted by its incorrect claim construction, we must remand for new findings regarding this issue in accordance with the correct claim construction, *e.g.*, whether the use of many cups is equivalent to the use of one cup, whether a needle is equivalent to a cup, and whether the use of a discontinuous vacuum is equivalent to the use of a continuous vacuum.

We note also that, on remand, the district court should strive to avoid the conceptual misunderstanding perhaps present in some of our case law. Namely, it is incorrect to refer to a claim as being expanded or enlarged when infringement is found under the doctrine of equivalents. *Wilson Sporting Goods Co. v. David Geoffrey & Assoc.*, 904 F.2d 677, 684, 14 USPQ2d 1942, 1948 (Fed. Cir. 1990) ("To say that the doctrine of equivalents extends or enlarges *the claims* is a contradiction in terms. The claims — i.e., the scope of patent protection *as defined by* the claims — remain the same and application of the doctrine *expands the right to exclude* to "equivalents" of what is claimed.") (emphasis in original).

AFFIRMED-IN-PART, VACATED-IN-PART AND REMANDED

COSTS

Each party to bear its own costs.

APPENDIX D

IN THE UNITED STATES DISTRICT COURT FOR THE SOUTHERN DISTRICT OF TEXAS HOUSTON DIVISION

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
ENTERED AUG 31, 1999
Michael N. Milby, Clerk

INSITUFORM TECHNOLOGIES, INC., INSITUFORM (NETHERLANDS) B.V., AND INSITUFORM GULF SOUTH, INC.,
Plaintiffs,

vs.

CAT CONTRACTING, INC., MICHIGAN SEWER CONSTRUCTION COMPANY, KANAL SANIERUNG HANS MUELLER GmgH & CO. HK, AND INLINER U.S.A.
Defendants.

CIVIL ACTION NO. H-90-1690

FINAL JUDGMENT

For the reasons stated in the Court's revised findings of fact and conclusions of law entered on December 31, 1996, (Instrument No. 372), as modified by the Federal Circuit's opinion issued on November 17, 1998, (Instrument No. 496), and the Court's revised findings of fact and conclusions of law of even date herewith, the Court enters judgment as follows:

Reasonable Royalty on Gulf Coast Market jobs:	$1,214,882
Reasonable Royalty on jobs performed by CAT/ Inliner licensees:	$2,344,287
Actual damages:	$3,559,169
Prejudgment Interest:	$3,381,034.81
Enhanced Damages:	$1,799,584
Attorney Fees:	$ 806,501.25
Grand Total Damages:	$9,546,289.06

The damages for which Michigan is jointly and severally liable are $778,452. Prejudgment interest on that amount only is $932, 110. 10.

THIS IS A FINAL JUDGMENT.

The Clerk shall enter this Order and provide a copy to all parties.

SIGNED this the 30th day of August, 1999, at Houston, Texas.

/s/ Vanessa D. Gilmore
VANESSA D. GILMORE
UNITED STATES DISTRICT JUDGE

APPENDIX E

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

INSITUFORM TECHNOLOGIES, INC.,
INSITUFORM (NETHERLANDS) B.V., AND
INSITUFORM GULF SOUTH, INC.,
Plaintiffs,
vs.
CAT CONTRACTING, INC., MICHIGAN SEWER
CONSTRUCTION COMPANY, KANAL
SANIERUNG HANS MUELLER GmgH & CO. HK,
AND INLINER U.S.A.
Defendants.

CIVIL ACTION NO. H-90-1690
UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
ENTERED AUG. 31, 1999
MICHAEL N. MILBY, CLERK

REVISED FINDINGS OF FACT
AND CONCLUSIONS OF LAW

This case was tried to the Court from February 21, 1995 to February 23, 1995 on the issue of liability. On September 30, 1995, this Court found that both Process 1 and 2 were infringing under the doctrine of equivalents. Defendants shortly thereafter modified Process 2 to a third process, Process 3, which Insituform stipulates is not infringing.

Defendants appealed the Court's final decision of infringement. On November 6, 1996, the Federal Circuit affirmed the Court's holding in part and vacated in part due to this Court's use of an incorrect claim con-

struction in reaching its decision that Process 1 and Process 2 were infringing under the doctrine of equivalents. The case was thereafter remanded for new findings on this issue.

Upon remand, this Court issued revised findings on December 31, 1996, again concluding Process 1 and 2 were infringing under the doctrine of equivalents. (Instrument No. 372, ¶¶ 23 and 24). Defendants then appealed this Court's order finding infringement under the doctrine of equivalents and enjoining Defendants from practicing either Process 1 or 2.

On the 9th day of September, 1997, the above-styled and numbered case came on for trial on the issue of damages. Both sides appeared and announced ready for trial, and the case was tried to the Court from September 9 to September 12, 1997. At the conclusion of Plaintiffs' case in chief, Defendants moved for judgment as a matter of law as to Plaintiffs' claims. The Court reserved ruling on Defendants' motions. The Court subsequently issued its findings of fact and conclusions of law on the issue of damages on September 3, 1998. (Instrument No. 496).

On November 17, 1998, the Federal Circuit issued its opinion regarding Defendants' appeal from this Court's order entered on December 31, 1996. The Federal Circuit affirmed this Court's finding that Inliner's Process 1 infringed the '012 patent, but reversed this Court's conclusion that Inliner's Process 2 infringed claim 1 of the '012 patent. (Instrument No. 496, at 1-2 and 15-16).

The Federal Circuit also remanded this case to this Court for findings on an alter ego issue. The Federal

Circuit concluded that KM was not liable for active inducement. This Court reached that same conclusion in the findings of fact and conclusions of law issued on issued on [sic] September 3, 1998. (Instrument No. 469, at 37-38). The Federal Circuit went a step further, however, and found that KM may be vicariously liable under the alter ego theory. (*Id.* at 15).[1] This Court had not addressed that theory of liability because it was not previously raised by the pleadings or the evidence. The Court allowed the parties to conduct some limited additional discovery so that it could address this issue as well as the damages issue on remand. (Instrument No. 486).

Thereafter, Plaintiffs and Defendants filed motions to amend this Court's findings of fact and conclusions of law issued on September 3, 1998. (Instrument No. 500 and 506). KM filed a motion for additional findings on the alter ego issue. (Instrument No. 504).

In addition, Plaintiffs have reurged its Rule 59(e) motion that was originally filed on September 2, 1998-more than ten (10) days after the date this Court's findings of fact and conclusions of law were filed. (Instrument No. 476). The Court previously denied Plaintiffs' Rule 59(e) motion without prejudice on October 27, 1998. (Instrument No. 487). Plaintiffs' Rule 59(e) motion should have been denied outright as untimely. Upon reconsideration of that motion and in light of the

[1] Essentially, the Federal Circuit noted that KMG is "[a] separate corporation related to KM [that] licensed the infringing technology to Inliner after KM received notice of the '012 patent." (Instrument No. 496, at 15.). The Federal Circuit reasoned that KM did not induce the infringement, but remanded the question as to whether KM was an alter ego of KMG and, therefore, vicariously liable for the infringement. (*Id.*).

rulings of the Federal Circuit, Plaintiffs' Rule 59(e) motion is **DENIED**. Defendants did not file a Rule 59(e) motion or seek leave to file a Rule 59(e) motion.

In their motions to revise the findings of fact and conclusions of law issued by this Court on September 3, 1998, the parties have requested the review and the reconsideration of matters that go far beyond the scope of the limited revisions required based on the rulings of the Federal Circuit, such as this Court's rulings on KM's direct liability for induced infringement, the joinder of BV, royalty amounts for [sic] for direct infringement in the Gulf Coast Market, enhanced damages, prejudgment interest, and attorney's fees. Essentially, the parties are improperly attempting to bring motions for reconsideration. The only issues this Court is reconsidering on remand are a revision of damages based on the finding of non-infringement of Process 2 and the alter ego theory with respect to KM.

Consequently, in light of the Federal Circuit's opinion, the Court enters the following revised findings of fact and conclusions of law based on the evidence presented. The Court will not change or add any factual findings, except as they relate to damages or the alter ego issue.[2]

I. Background

Plaintiffs Insituform (Netherlands) BV ("BV"), Insituform Technologies, Inc. ("ITI"), Insituform Gulf South ("IGS") (hereinafter collectively referred to as "Insituform") are specialists in the business of pipe rehabilitation. BV, although not licensed to do business,

[2] The following sections contain revisions: section V (Damages) and section VI (Conclusion).

is the record owner of the intellectual property rights to the trenchless technologies of the Insituform Process for pipeline rehabilitation.[3] (Plaintiffs' Ex. 63). BV is wholly owned by its holding company, Insituform Licensees B.V. ("Insituform Licensees"). *Id.* Insituform Licensees, also not licensed to do business, is wholly owned by INA Acquisition Corporation ("INA") which in turn is owned by ITI, the parent company. *Id.* In addition to serving as the administrative headquarters for the Insituform organization, ITI also conducts research, performs Insitutube manufacturing and product engineering. Insituform North America Corp. ("INAC"), not a party to this suit, is wholly owned by ITI and is the sister company to INA. *Id.* INAC is the domestic licensing company for the Insituform Process in the United States. *Id.* Finally, IGS is wholly owned by Naylor Industries, Inc. ("Naylor"), a wholly owned subsidiary of ITI. *Id.* IGS is authorized to do business in Louisiana, Mississippi and Texas and licensed to perform Insituform technology in designated regions throughout the United States. *Id.*

Defendants Cat Contracting, Inc. ("CAT"), Inliner U.S.A ("Inliner"), Inliner Americas ("Americas"), Kanalsanierung Hans Mueller GmbH & Co. KG ("KM") and Michigan Sewer Construction Company ("Michi-

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[3] Insituform's patent rights were originally held by Insituform Licensees, a subsidiary of Insituform Group Limited ("IGL") at the time of IGL's acquisition in December of 1992. The patent rights were then transferred to BV by a Sale and Purchase Agreement executed on December 7, 1992. (Plaintiffs' Ex. 63). A patent assignment dated December 3, 1992, was filed with the United States Patent and Trademark Office on December 7, 1992. Under the patent assignment, Insituform Licensees conveyed to BV "all claims for damages by reason of past infringement of said patents. . . ." (Defendants' Ex. 1 subexhibit D).

gan Sewer") (hereinafter collectively referred to as "Defendants") are likewise in the business of rehabilitating and restructuring various types of pipes, including sanitary, storm sewer, water main, conduit and industrial pipe. Americas operates as the holding company for its wholly-owned operating subsidiaries, CAT and Inliner. Inliner oversees the marketing of America's trenchless procedure for pipe rehabilitation to potential licensees, municipalities and industrial customers. In addition, Inliner manufacturers pipe liners and related materials which it sells to CAT and its licensees. CAT is responsible for marketing, bidding/negotiating contracts with customers and managing its pipeline rehabilitation contracts. KM is a licensee of Kanal Mueller Gruppe International ("KMG"), a German pipeline cleaning and rehabilitation company founded in 1951. KM operates in Germany. Michigan Sewer is a Michigan corporation also in the pipe rehabilitation business.

In early 1989, after reading about KM's proprietary sewer rehabilitation technology in a trade magazine, Mr. Guilio Catallo ("Catallo"), the president of CAT, contacted KM for the purpose of obtaining a license for that technology. In March of 1989, he traveled to Europe to observe KM's process for impregnating and installing liners in underground sewer lines and to negotiate a license from KM. On March 17, 1989, Catallo signed a letter of intent with KM to license KM's technology.[4] Although KM stated in a letter written on November 10, 1989, that CAT was a "qualified Licensee for our KM-INLINER sewer relining process for the territories of

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[4] KM and CAT had, a one point, contemplated entering into an license agreement-Plaintiffs produced at trial a license agreement between the parties that had never been executed.

the USA" there was no formal license agreement executed by the parties. (Plaintiffs Ex. 11 at Ex. 11). An actual license agreement, however, was later executed between KMG and Inliner, permitting CAT's use of "inventions for the lining of pipelines and passageways known as 'INLINER' and ... the letters Patent therefore issued by the United States of America, being Patent No. 4,777,562." (Plaintiffs' Ex. 7 at p. 10). The License Agreement also stated that "The Licensee has been informed of a threat of a possible claim for infringing the INSITUFORM method." *Id.*

Catallo testified that KM told him, during his March 1989 visit, that it had been involved in a patent dispute with Insituform. Based on this information, Catallo contacted Arnold, White & Durkee ("AWD"), a Houston based law firm specializing in intellectual property rights, upon his return from Germany. Catallo asked AWD to analyze the American counterparts of the patents that Insituform had used to challenge KM's patents in Germany and to advise him whether use of KM's technology would infringe such patents. Before Catallo received AWD's opinion regarding the potential, if any, for infringement of Insituform's patents, he signed a bid on behalf of CAT Contracting and Michigan Sewer, a joint venture, to perform pipe rehabilitation services for the City of Houston, specifically, Wastewater Job Nos. 3907-7, 3907-12 and 3907-16 (hereinafter referred to the "Sims Bayou Contracts"). Catallo testified, though, he did not submit such bid until March 21, 1989, after his lawyer at AWD, Susan Knoll ("Knoll"), orally advised him that use of the KM technology would not, in her view, infringe Insituform's patents Nos. 4,009,063 ('063 patent) and 4,786,345 ('345 patent). Knoll did not mention Insituform patent No. 4,366,012

('012 patent), which covers the pipe rehabilitation process at issue in this case, since there was no European patent comparable to the '012 at that time. Catallo subsequently received a detailed written report, providing the analytical basis for Knoll's earlier oral opinion of noninfringement. The report contained an analysis regarding the potential for infringement of only the '063 and '211 patents.

During the bidding process for the Sims Bayou Contracts, Catallo was sent a letter dated April 7, 1989, by Insituform's attorney, Mr. Harold James ("James"), notifying CAT and Michigan Sewer that if they practiced the process being utilized by KM, they would infringe the '063 patent and the '345 patent. The letter did not address the '012 patent nor was Mr. Catallo notified of the '012 patent until this lawsuit was filed. Catallo and Knoll testified that it was due to this lack of notice regarding the existence of the '012 that a written opinion concerning such patent was not prepared by AWD. However, neither Catallo nor AWD had previously made any attempt on their own to determine what other patents Insituform owned in the United States and whether the use of the FM process in the United States would infringe these patents, if any did in fact exist.

CAT/Michigan Sewer submitted the lowest bid for the Sims-Bayou Contracts and was, as a result, awarded the jobs. The Sims Bayou Contracts No. 3907-7, 3907-12 and 3907-16 were executed between the City of Houston and CAT/Michigan Sewer on 8/7/89, 10/23/89 and 11/13/89, respectively. KM assisted CAT/Michigan Sewer in the performance of these jobs by demonstrating to CAT/Michigan Sewer in March of 1989, the two cup German Inliner vacuum impregnation technique Catallo had

earlier observed and by training CAT/Michigan Sewer's personnel to properly use such technique. From this method of impregnation, the Multiple Cup Process ("Process 1"), which utilizes a plurality of vacuum cups to draw a vacuum from a corresponding number of slits in a liner that had been inserted into the pipe to be repaired, was developed by CAT and Inliner. Process 1 was used to complete the Sims-Bayou Contracts.

On February 2, 1990, Insituform filed an original complaint against Defendants in the Eastern District of Michigan, alleging infringement not only of the '063 and '345 patents, but also of the '012 patent. In May of 1990, the case was transferred to the Southern District of Texas. Insituform filed an amended complaint in this court, realleging infringement of the '063 and '012 patents but dropping charges relating to the '345 patent. Defendants filed an answer, asserting, among other things, that the patents had not been infringed.

In June 1991, after a two-week trial conducted by Judge Lynn Hughes, a jury returned a verdict that included the finding that both patents were infringed. Defendants filed motions for new trial and judgement notwithstanding the verdict. On August 28, 1991, Judge Hughes partially granted Defendants' motions, ordering judgment notwithstanding the verdict on the issue of literal infringement of the '063 and the '012 patents and granting a new trial on the issue of infringement under the doctrine of equivalents. The matter of damages had previously been bifurcated from the issue of infringement by order of the Court dated March 5, 1991.

Following the conclusion of the first trial, Inliner began using a second process for pipe rehabilitation, Process 2. Process 2 entails the use of tubes or "needles",

instead of vacuum cups as in Process 1, which are positioned along the liner to create a continuous vacuum. Catallo testified that the shift from cups to needles was based in part on the fact that needles did not fall, as did the cups, from the outer felt layer of the liner and in part on Knoll's belief that infringement of the '012 was less likely if needles were used. Catallo also testified that CAT/Inliner taught only Process 2 to their licensees, the first of whom was authorized to use the Inliner technology in 1992.

II. Damages Trial

The damages portion of this case was tried on September 9, 1997. Insituform claims that IGS, the exclusive licensee of Insituform technology in the United States, is entitled to recover its lost profits, which amount to $10.5 million, on those jobs for which IGS and CAT/Inliner directly competed but which were ultimately awarded to CAT/Inliner. ITI contends that it is entitled to recover its lost profits, in the amount of $7.7 million, on the liners it would have sold to IGS had IGS been awarded the jobs performed by CAT/Inliner. With respect to infringement by CAT/Inliner licensees, Insituform maintains it should be awarded no less than a reasonable royalty, in accordance with 35 U.S.C. § 284, calculated at a royalty rate of 20.5 % for a total of $6.2 million because CAT/Inliner actively induced infringement by their licensees. Finally, Insituform asserts that it is entitled to enhanced damages and attorneys' fees for Defendants' willful infringement and approximately $6.8 million in pre-judgment interest.

In contrast, Defendants argue that neither IGS nor ITI have standing to sue since neither entity is the legal owner or exclusive licensee of the patent in issue, thereby

precluding their entitlement to monetary damages under the Patent Act. Defendants next argue that the true owner of the patent, BV, has not been joined as a party to this suit and as a result, there is no evidence in the record to support any award of damages in its behalf. Defendants also claim that adding BV as a party plaintiff at this late date would be unduly prejudicial to Defendants' case. At a minimum, Defendants claim, if BV is joined as a party, it is only entitled to reasonable royalty damages at a rate of no more than .4%. If both IGS and ITI have standing to sue, Defendants contend that the measure of damages should be a reasonable royalty and not lost profits since neither IGS or ITI has met their burden of proof with regard to lost profit damages. KM, however, denies liability for damages because, it contends, there is no proof that it induced infringement. Absent such proof, KM argues, it cannot be held jointly and severly liable for any damages Insituform sustained as a result of the proven infringement. Inliner and CAT also maintain that they cannot be held liable for inducing infringement and that any damages Insituform has requested as a result of CAT/Inliner licensees' alleged infringement are therefore unwarranted. In addition, Inliner and CAT contend that Insituform has failed to adduce proof that their infringement was willful, thereby negating Insituform's claim for enhanced damages and attorneys' fees and that any prejudgment interest awarded should be computed as simple interest and not compounded, with the period during which Insituform did nothing to prosecute this action-July of 1994 through June of 1994-excluded from the computation.

III. Standing

A. IGS' Standing to Sue

Insituform first contends that IGS has standing to sue in this case because it is the exclusive licensee of Insituform technology. In order to be entitled to money damages for patent infringement, the plaintiff must generally show that it held legal title to the patent at the time the infringing acts occurred. *Rite-Hite Corp. v. Kelly Co., Inc.*, 56 F.3d 1538, 1551 (Fed. Cir. 1995). Legal title is conveyed only thru transfer of the entire patent, an undivided portion or share of the entire patent, or by conveyance of all rights under the patent in a specific geographical region of the United States. *Id.* In other words, the monopoly granted by a patent:

> is one entire thing, and cannot be divided into parts, except as authorized by law. The patentee or his assigns may, by instrument in writing, assign, grant, and convey either (1) the whole patent comprising the exclusive right to make, use, and vend the invention throughout the United States; or (2) an undivided part or share of that exclusive right; or (3) the exclusive right under the patent within and throughout a specified part of the United States.

Waterman v. Mackenzie, 138 U.S. 252,255, 11 S.Ct. 334, 335 (1891). A transfer of either of these three kinds of interests "is an assignment, properly speaking, and vests in the assignee a title in so much of the patent itself with a right to sue for infringers." *Waterman*, 138 U.S. at 255, 11 S.Ct. at 335. "Any assignment or transfer, short of one of these, is a mere license, giving the licensee no title in the patent, and nor right to sue at law in his own name." *Id.* Therefore, a party who has "received, not only the right to practice the invention

within the given territory, but also the patentee's express or implied promise that others shall be excluded from practicing the invention within that territory as well" is an exclusive licensee, entitled to bring suit for infringement as a co- plaintiff with the patentee. *Rite Hite*, 56 F.3d 1538, 1552 (Fed. Cir. 1995).

In addressing the right of an exclusive licensee to bring suit for infringement, the court in *Philadelphia Brief Case Co v. Specialty Leather Product Co.*, stated that:

> [s]ince the creation of such rights in the so-called exclusive licensee, impliedly if not expressly, prevents the proprietary owner of the patent from creating further rights therein in unknown third parties, this so called exclusive licensee, while only a licensee, comes so close to having truly proprietary interests in the patent, that the courts have held that he is equitably entitled to sue on the patent, provided he joins the true proprietor of the patent in such suit, either as a willing or unwilling plaintiff or defendant.

145 F.Supp. 425, 428 (D. N.J. 1956). Thus, "if a party has not received a promise of exclusivity under the patent it cannot have co-plaintiff standing in an infringement action." *Ricoh Co. Ltd v. Nashua Corp.*, 947 F.Supp. 21, 24 (D. N.H. 1996).

In support of its contention that it is an exclusive licensee, IGS argues that the "contract between ITI and IGS is *expressly* a patent license, and it gave IGS the exclusive right to practice the patented invention in its territory. That is what the contract explicitly says- 'exclusive license'". (Plaintiff's Consolidated Pretrial Memorandum at 31) (emphasis in original). However,

"[w]hether a transfer of a particular right or interest under a patent is an assignment or a license does not depend upon the name by which it calls itself, but upon the legal effect of its provisions." *Waterman*, 138 U.S. at 256, 11 S.Ct. at 335. Simply using the language "exclusive license" in the body of the agreement does not equate to a "promise of exclusivity" absent the conveyance of rights amounting to proprietary interests in the patent.

IGS further asserts that the license agreement clearly conveys to IGS the exclusive right to practice the patented technology in a particular geographical region. Specifically, IGS argues that.:

> [i]t enjoyed an exclusive position in its defined territory—it was completely exclusive with respect to the entire world other than ITI licensees in other territories, and with respect to those other licensees it enjoyed a very favorable competitive position—another ITI licensee, if it wanted to enter IGS's territory, would have to pay a penalty of 12% of the contract price, which constituted a quite substantial cushion in the competitive bidding which was involved in this industry. For IGS to lose a bid to an invading ITI license it would have to grossly overbid, so that as a matter of practicality it was exclusive except when it felt that it did not need to be exclusive and hence would take a chance on bidding high.

(Plaintiff's Consolidated Pretrial Memorandum at 35-36).

Contrary to IGS's contentions, however, the license agreement does not transfer to IGS an exclusive inter-

est in the patented technology. While the agreement does provide for the assessment of a penalty in the event another licensee invaded IGS's territory, it does not grant IGS the right to exclude others from its geographic area of operation. Rather, the agreement states that

> [INAC (the licensing company for the Insituform process and sister company to BV, the record owner of Insituform's patents)], in its sole discretion, has the right itself to operate businesses under [the "Insituform" trademark], and to grant other licenses in, to and under such Proprietary Marks on any terms and conditions North America deems fit; provided, however that INAC may so operate or grant other licenses subject to the limitations of this agreement within [IGS's] exclusive territory, but solely for use of the Insituform Process in lining tunnels, pipelines, and other passageways used to carry natural or manufactured fuel gases or other hazardous gases.

(Plaintiff's Ex. 18A).

In addition, the agreement states that "INAC retains the right to grant exclusive Licenses to other Operators in other defined Territories" and that "[IGS] acknowledges that INAC cannot prevent other operators from exploiting the subject matter in [IGS's] exclusive territory." *Id.* Moreover, in the event third parties improperly used Insituform technology, IGS was precluded under the terms of the agreement from bringing suit for such conduct on its own and without prior approval from INAC. The agreement also fails to make provision for the distribution of any recovery obtained through the prosecution of an infringement action. Instead, the agreement provides in relevant part that:

> INAC does hereby agree, at its expense, to use its best efforts to defend the Patent Rights by such means as in its sole discretion may determine appropriate, including but not limited to, patent infringement suits. INAC reserves, however, the exclusive right to determine whether a patent infringement has occurred or whether litigation or other action is appropriate or feasible.

Id. Finally, the agreement states that in the event INAC undertook the defense or prosecution of any litigation, "IGS agree[d] to execute any and all documents and do such acts and things which may, in the opinion of counsel for INAC, be necessary to carry out such defense or prosecution, either in the name of INAC or in the name of [IGS] as INAC shall elect." *Id.* IGS's cooperation in bringing this suit, however, is not sufficient, in and of itself, to confer upon IGS standing to sue. *Rite-Hite*, 56 F.3d at 1553 ("While the patentee and the [licensees] have cooperated in this litigation, that fact alone does not establish their right to sue."). Thus, absent language that transfers to IGS a proprietary interest in the patented technology or authorizes IGS to sue infringers, IGS lacks standing to bring a patent infringement action, requiring its dismissal as a party to this action.

B. ITI's standing to sue

Insituform next contends that ITI has standing to sue for damages resulting from Defendants' infringement because ITI, as sole owner of INAC and parent of BV "should be considered as the exclusive licensee in the United States." (Instrument No. 452 at. 12). Insituform argues that such a result is proper because ITI "has wholly owned INAC continuously from its inception,

and ... ITI has . . . provide[d] technical assistance to its licensees and m[ade] liners and [sold] them to its licensees." *Id.* at 12. Moreover, Insituform argues that:

> ITI when it acts as the exclusive company in this country to manufacture liners and sell them to licensees, is also exercising rights which the license from the titular patent owner grants. Hence in reality both ITI and INAC are together exercising exclusive license rights, but it is only ITI which is really in business, which has any dealing with the outside world....

Id. at 12-13.

It is well established that "an equitable title to a patent accrues to a corporation in patents owned by its constituent corporation." *Pipe Liners, Inc. v. American Pipe & Plastics Inc.*, 893 F.Supp. 704, 706 (S.D. Tex. 1995). Consequently, a parent corporation would have standing in an infringement action to seek equitable remedies. *Id.* However, there is no authority, either provided by Insituform or that this Court could find on its own, for the proposition that a parent corporation, merely by virtue of its equitable title, i.e., its ownership in a subsidiary holding legal title to a patent, is afforded a legal remedy for infringement of its affiliate's patent. *See Site Microsurgical Systems, Inc. v. Cooper Co.*, 797 F.Supp. 333, 338 (D. Del. 1992) ("The Court is not convinced, and the plaintiff offers no authority, that a parent corporation effectively has the patent rights of owners, assignees, and licensees by virtue of its ownership of a subsidiary holding a patent."). Nor is there any decision expressly stating that a parent's involvement with or control of a subsidiary's actions taken in connection with the patented product is sufficient, by itself to

justify recognizing the parent as the real party in interest and allowing it a legal remedy for patent infringement.

As stated above, the general rule governing standing in patent cases "is that one seeking to recover money damages for infringement of a United States patent (an action 'at law') must have held the legal title to the patent during the time of the infringement." *Arachnid, Inc. v. Merit Industries, Inc.*, 939 F.2d 1574, 1579 (Fed. Cir. 1991); 35 U. S.C. §§ 101, 102, 151. "'These owners are the patentee, his assignee, his grantee, or his personal representative; and none but these are able to maintain an action for infringement in a court of law.'" *Id.* (quoting *Crown Die & Tool Co. v. Nye Tool & Machine Works*, 261 U.S. 24, 43 S.Ct. 254 (1923)). In addition. "an exclusive licensee generally has standing to sue for infringement for the unauthorized use within the area of exclusivity." *Site*, 797 F.Supp. at 337.

Exceptions to this rule authorizing the patentee or its exclusive licensee standing, however, have only been made to confer the right to sue to: (1) an assignee in a suit for infringements occurring prior to the time title was transferred to him when the assignment of the patent was coupled with an assignment of a right of action for past infringement; *Site*, 797 F.Supp. at 1579 n.7, and (2) a sole licensee without an exclusive license when the sole licensee has been shown to be directly damaged by an infringer in a two supplier market and when there is a clearly defined nexus between the sole licensee and the patentee. *Kalman v. Beryln Corp.*, 914 F.2d 1473, 1482 (Fed. Cir. 1990). Such exceptions are recognized "not only [to] give effect to principles of equity but also [to] the Congressional mandate that, in patent actions, '[u]pon finding for the claimant the court

shall award the claimant damages adequate to compensate the infringement. . . .'" *Kalman,* 914 F.2d at 1482 (quoting 35 U.S. C. § 284 (1982)).

Insituform asserts that the exception recognized in *Kalman* has been used to confer standing in the following situations to: (1) an entity that was actively involved in the manufacture and distribution of the patented technology under the direction and control of the exclusive licensee, *CVI/Beta Ventures, Inc. v. Tura LP, Et Al.,* 905 F.Supp. 1171, 1198 (E.D. N.Y. 1995), and (2) an entity that had not been given exclusivity under the patent, yet, for all practical purposes, operated as the exclusive licensee, see *Ricoh Company Ltd v. Nashura Corp.*, 947 F.Supp. 21, 24 (D.N.H. 1996). Insituform argues that based on the result reached by the courts in these cases, this Court should grant ITI the entity which is essentially performing the duties of an the exclusive licensee by manufacturing and marketing liners and providing technical assistance to Insituform, licensees, standing to sue. The Court, however, does not agree.

In *CVI/Beta Ventures, Inc. v. Tura LP, Et Al*, the court granted standing to two corporations, Rothandberg, Inc. ("Rothandberg") and Marcolin U.S.A., Inc., ("Marcolin"), who were affiliated and controlled by the exclusive licensee, Marchon Eyewear Inc., ("Marchon"). Although both companies functioned as Marchon's manufacturing arm, neither possessed a legal interest in the disputed patent. *CVI/Beta Ventures*, 905 F.Supp. at 1198. In determining that Marcolin and Rothandberg could in fact maintain an action for infringement, the court focused on the relationship between the entities, stating that *Kalman* had intended standing to be granted when there was a "close nexus between the patentee and the licensee with respect to the marketing of the pat-

ented item." *Id.*[5] In reaching this conclusion, the court attempted to distinguish its holding from the decision reached in *Site Microsurgical System Inc. v. Cooper Co.*

The district court in *Site* found that the *Kalman* exception existed only in cases where there was "(1) direct damage to the sole licensee by an infringer in a two supplier market, and (2) a close nexus between the sole licensee and the patentee." 797 F.Supp. at 338. The patentee in this case, Site Microsurgical Systems, Inc., had filed a motion to join its parent corporation, Iolab Corporation as a plaintiff. Iolab argued that joinder was proper because "'it [was] Iolab who effectively controll[ed] the patents and who ultimately suffers the loss from the [defendant's] infringement.'" *Site*, 797 F.Supp. at 338 (quoting excerpts from the plaintiff's motion). Iolab further argued that it was "the 'real party in interest'

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[5] Notably, the court in *CVI/Beta Ventures* was not deciding the standing issue de novo but was instead evaluating the propriety of a previous ruling by a magistrate judge. The magistrate's decision to grant Marcolin and Rothandberg standing to sue had subsequently been adopted by the district court judge to whom the case had been assigned at the time. After the trial and a jury verdict in Rothandberg's and Marcolin's favor, the defendant requested the court to revisit this issue. The court was therefore constrained in its review by the law of the case doctrine which limits reconsideration of an earlier court order "only upon a showing that the applicable law has changed, that pertinent new evidence has been developed, or that the prior order was clearly erroneous or manifestly unjust." *CVI/Beta Ventures*, 905 F.Supp. at 1197. In denying the defendant's request for reconsideration, the court found that "[p]articularly in light of *Kalman*, the decisions rendered [previously] were not clearly erroneous .... [and] there is no reason to allow defendants to relitigate the question of standing. ... " Id. at 1198. Thus, under this more deferential standard of review, the *CVI/Beta Venture* court's holding and the reasoning it employed to reach such a result is, arguably, of limited value.

and that it [had] standing under the test in *Kalman*." *Id.* at 338. In denying Iolab's request, the court stated:

> Iolab possesses no license of any kind and it is not marketing the patented technology on behalf of the patentee. Iolab's only connection to the patented technology is its attenuated relationship through corporate ownership... [Moreover], Iolab's argument fails to offer authority to support the proposition that a mere close nexus between a patentee and a third-party lacking any patent rights is sufficient under the statutory scheme. The Court is not persuaded that the patent laws are designed to compensate every party "related" to the patented technology or every party who "anticipates" the sale of the patented products.

Id.

Much like Iolab in *Site*, *CVI/Beta Ventures* mistakenly relied on *Kalman* for the proposition that a corporate connection alone is sufficient to extend standing to entities otherwise not entitled to sue for patent infringement. The *CVI/Beta Ventures* court reached its decision to grant standing without either discussing the first element of the *Kalman* exception or citing authority stating that such an omission was permissible. *Kalman* specifically held that standing would be permitted only when both "the sole licensee ... has been shown to be directly damaged by an infringer in a two supplier market, and... the nexus between the sole licensee and the patentee is so clearly defined." *Kalman*, 914 F.2d at 1482. By overlooking this first requirement, the *CVI/Beta Ventures* decision clearly exceeds the holding in *Kalman* and directly contradicts the exclusivity concept of patent law. Moreover, the decision advances, as

alluded to by the court in *Site*, a rule of law which would permit "every party 'related' to the patented technology" a legal remedy for infringement. *Site*, 797 F. Supp. at 338. Unlike the court in *CVI/Beta Ventures*, this Court declines to extend *Kalman* beyond its holding to permit an entity like ITI, which is not operating as the sole licensee in a two supplier market, standing simply because of the corporate interrelationship between it and the patentee.[6]

Insituform also relies on *Richoh Co. Ltd v. Nashua Corp.*, as support for its contention that standing may be granted to a non patent-owner under certain circumstances, particularly those present in the instant case. 947 F.Supp. 21, 23 (D. N. H. 1996). In *Richoh*, the court held that a wholly owned subsidiary of the patentee would have standing if it was first determined upon review of the surrounding circumstances that an implied exclusive license existed between the parties. *Richoh,* 947 F.Supp. at 23. The court considered, as a key factor in making this determination, the relationship between the entities and the degree to which the subsidiary was controlled by the patentee. *Richoh*, 947 F. Supp. at 23. However, the court also noted that:

> [t]he exclusive character of the manufacturing license held by REI [the subsidiary] is demonstrated not only by the reality that Richoh Ltd. [the parent corporation] effectively controls the manufacture of all products subject to the '063 Patent, but also by the fact that REI was and still is the sole United

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[6] The Court also finds that IGS should not be conferred standing under the *Kalman* exception because the proof adduced at trial does not show that IGS was operating as the sole licensee in a two supplier market.

> States manufacturer of Richoh copier supply products .... In addition, Richoh Ltd. has never granted any party other than REI a commercial license under the '063 Patent.

Ricoh, 947 F.Supp. at 24. Such is not the case here. ITI is not the sole licensee of Insituform technology nor is there evidence indicating that Insituform BV, the patent holder, intended ITI to operate as its exclusive licensee. Absent legal ownership or a promise of exclusivity under the patent, ITI has not had any of its legal rights violated by Defendants' infringement. At most, ITI has suffered only financial loss. *See Lindemann Maschinenfabrik v. American Hoist & Derrick Co.*, 895 F.2d 1403, 1406 (Fed Cir. 1990) ("In patent law, the fact of infringement establishes the fact of damage because the patentee's right to exclude has been violated."). However, "economic injury alone does not provide standing to sue under the patent statute." *Ortho Pharmaceutical Corp v. Genetics Institute*, 52 F.3d 1026, 1031 (Fed. Cir. 1995). Therefore, based on the foregoing, the Court finds that ITI lacks standing to sue for monetary damages.

IV. Joinder

Insituform now moves under Rules 15(a) and 21 to add INAC and if necessary, Insituform (Netherlands) B.V. as a party plaintiffs. Rule 15(a) provides that "a party may amend the party's pleading only by leave of court or by written consent of the adverse party; and leave shall be freely given when justice so requires." Fed. R. Civ. P. 15(a). Rule 21 states that "parties may be dropped or added by order of the court on motion of any party or of its own initiative at any stage of the action and on such terms as are just." Fed. R. Civ. P. 21.

The decision to grant or deny a motion for leave to amend lies within the sound discretion of the trial court. *Benitez-Allende v. Alcan Aluminio do Brasil, S.A.*, 857 F.2d 26, 36 (1st Cir. 1988). However, leave should be granted "[i]n the absence of any apparent or declared reason—such as undue delay, bad faith or dilatory motive on the part of the movant, repeated failure to cure deficiencies by amendments previously allowed, undue prejudice to the opposing party by virtue of allowance of the amendment, [or] futility of amendment. *Foman v. Davis*, 371 U.S. 178, 182, 83 S.Ct. 227, 230 (1962). Moreover, "'outright refusal to grant the leave without any justifying reason appearing for the denial is not an exercise of discretion; it is merely abuse of that discretion and inconsistent with the spirit of the Federal Rules." *Kalman,* 914 F.2d at 1480 (quoting *Froman*, 371 U.S. at 182, 83 S.Ct. at 230). This liberality in granting leave to amend is not completely unrestricted; rather, it remains "subject to the qualification that amendment of the complaint does not cause the opposing party undue prejudice." *DCD Programs, Ltd v. Leighton*, 833 F.2d 183, 186 (9th Cir. 1987). The burden is on the party opposing the amendment to show prejudice. *Beeck v. Aquaslide 'N' Dive Corp.*, 562 F.2d 537, 540 (8th Cir. 1977).

Defendants argue that they would be prejudiced if INAC is allowed to join this suit because they were unaware of the existence of INAC until the eve of trial and because

> there is no competent damages proof for either the patentee or the exclusive licensee. It is clear from the damages presentation that Insituform wants lost profits. Neither Insituform Netherlands BV nor INAC can meet this standard. The requested

> relief (a) join these necessary parties, (b) ignore the fact that they cannot possibly meet the threshold requirements for lost profits and have proven no monetary damages under any theory, but (c) award lost profits for jobs and tubes anyway.

(Instrument No. 453 at 2).

Insituform, on the other hand, maintains that "[t]here is no prejudice where, as in the present case, the motion does not seek to add parties that are "new", i.e., strangers to the case, but only to add parties whose rights and interests have been at issue in the case all along and about whom there has already been full discovery with respect to the issues in dispute." (Instrument No. 452 at 17). Since INAC is neither the legal patent holder nor an exclusive licensee, it would not have standing to sue even if it were joined as a party. Accordingly, the Court will deny Insituform's motion to join INAC as a party.

With regard to B.V., Defendants argue that "Insituform Netherlands BV is named in the caption, and it unquestionably has standing. However, the undisputed evidence demonstrates that it was erroneously named via an Order, prepared by plaintiff's counsel, signed by this Court in November 1994 on the ground that it was nothing more than a 'name change'. (Defendants' Motion for Judgment as a Matter of Law Because of No Standing and No Damages Proof, Instrument No. 442 at 3-4). The Court does not agree and finds that BV was made a party to this suit by order of this Court on November 30, 1994. (Instrument No. 185). In addition, the Court finds that the rights of the legal patent owner have been at issue since the inception of this case and that Insituform Netherlands BV has presented evidence of recoverable monetary damages that Defen-

dants have been able to rebut at trial. Therefore, Defendants would not be prejudiced if BV is recognized as a party plaintiff in this suit.

V. Damages

Plaintiffs divided their damages proof into two distinct categories: damages owed by CAT/Inliner and Michigan Sewer for direct infringement in the Gulf Coast Market and damages owed by CAT/Inliner and KM for actively inducing infringement by CAT/Inliner licensees.

A. Gulf Coast Market

The Patent Act provides that " [u]pon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement but in no event less than a reasonable royalty for the use made of the invention by the infringer." 35 U.S.C. § 284. The purpose of section 284 is to restore the patent owner to the financial position "he would have occupied but for the infringement." 7 CHISUM ON PATENTS, § 20.03 (1997). Damages under section 284 may include "lost profits due to diverted sales, price erosion, and increased expenditures caused by infringement." *Minco, Inc. v. Combustion Engineering, Inc.*, 95 F.3d 1109, 1118 (Fed. Cir. 1996). However, lost profits cannot be awarded unless the patent holder can "show that the infringer actually caused the economic harm for which the patentee seeks compensation." *Id.* In other words the patentee must produce evidence of a "'reasonable probability that [the patent holder] would have made the asserted profits absent infringement.'" *Id.* (quoting *King Instruments Corp. v. Perego*, 65 F.3d 941, 952 (Fed. Cir. 1995)). "When actual damages, e.g. lost profits, cannot be proved, the patent owner is entitled to a reasonable royalty."

Panduit Corp. v. Stahlin Bros. Fibre Works, Inc., 575 F.2d 1152, 1153 (6th Cir. 1978). Since BV is neither in the business of marketing nor performing the patented technology and since there is no evidence in the record of profits BV would have made in the absence of infringement, the most appropriate measure of recovery in the instant case is a reasonable royalty. *See Minco*, 95 F.3d at 1119 (holding that although a "patent owner may not operate in the specific geographical area covered by the infringer or may not have had the manufacturing or marketing capacity to make the infringer's sales . . . . the patentee would still be entitled to a reasonable royalty on each of those sales"); *Hanson v. Alpine Valley Ski Area*, 718 F.2d 1075, 1078 (Fed Cir. 1983) ("If actual damages cannot be ascertained, then a reasonable royalty must be determined."). All recoverable damages will be awarded to BV and Insituform's corporate structure and the distribution of any monies ultimately awarded BV is not relevant to the Court's damage analysis.

A reasonable royalty is an amount "'which a person, desiring to manufacture and sell a patented article, as a business proposition, would be willing to pay as a royalty and yet be able to make and sell the patented article, in the market, for a reasonable profit.'" *Panduit*, 575 F.2d at 1157-58 (quoting *Goodyear Tire and Rubber Co. v. Overman Cushion Tire Co.*, 95 F.2d 978, 984 (6th Cir. 1937)). "The royalty may be based upon an established royalty, if there is one, or if not, upon the supposed result of hypothetical negotiations between the plaintiff and defendant."[7] *Rite-Hite Corp. V. Kelly Co.*,

[7] Although hypothetical negotiations presumes willing participants, which would not be the case here where Insituform and the

Continued on next page.

Inc., 56 F.3d 1538, 1554 (Fed. Cir. 1995). In predicting the outcome of such negotiations, the court must "envision the terms of a licensing agreement reached as a result of a supposed meeting between the patentee and the infringer at the time infringement began." *Id.* The following factors are routinely considered in establishing a reasonable royalty under these circumstances:

1. The royalties received by the patentee for the licensing of the patent in suit, proving or tending to prove an established royalty.

2. The rates paid by the licensee for the use of other patents comparable to the patent in the suit.

3. The nature and scope of the license, as exclusive or nonexclusive; or as restricted or nonrestricted in terms of territory or with respect to whom the manufactured product may be sold.

4. The licensor's established policy and marketing program to maintain his patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve that monopoly.

Footnote 7 continued.

Defendant are direct competitors, such concept is employed by the courts only "as a means of arriving at reasonable compensation and its validity does not depend on the actual willingness of the parties to the lawsuit to engage in such negotiations; there is, of course, no actual willingness on either side." *Hanson v. Alpine Valley Ski Area, Inc.*, 718 F.2d 1075, 1081 (Fed. Cir. 1983). Courts have, however, "recognized the need to distinguish between royalties payable to infringers and non-infringers." *Fromson v. Western Litho Plate & Supply Co.*, 853 F.2d 1568, 1575 n. 11 (Fed. Cir. 1988).

5. The commercial relationship between the licensor and licensee, such as, whether they are competitors in the same territory in the same line of business; or whether they are inventor and promotor.

6. The effect of selling the patented speciality in promoting sales of other products of the licensee; the existing value of the invention to the licensor as a generator of sales of his non-patented items; and the extent of such derivative or convoyed sales.

7. The duration of the patent and the term of the license.

8. The established profitability of the product made under the patent; its commercial success; and its current popularity;

9. The utility and advantages of the patent property over the old modes or devices, if any, that has been used for working out similar results.

10. The nature of the patented invention; the character of commercial embodiment of it as owned and produced by the licensor; and the benefits to those who have used the invention.

11. The extent to which the infringer has made use of the invention; and any evidence probative of the value of that use.

12. The portion of the profit or of the selling price that may be customary in the particular business or in comparable businesses to allow for the use of the invention or analogous inventions.

13. The portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, or significant feature, or improvements added by the infringer.

14. The opinion testimony of qualified experts.

15. The amount that a licensor (such as the patentee) and a license (such as the infringer) would have agreed upon (at the time the infringement began) if both had been reasonably and voluntarily trying to reach an agreement; that is, the amount which a prudent licensee—who desired, as a business proposition, to obtain a license to manufacture and sell a particular article embodying the patented invention—would have been willing to pay as a royalty and yet be able to make a reasonable profit and which amount would have been acceptable by a prudent patentee who was willing to grant a license.

Georgia-Pacific Corp. v. United States Plywood Corp., 318 F.Supp. 116, 1120 (S.D.N.Y. 1970). The assessment and computation of damages under 35 U.S.C. § 284 is a matter within the sound discretion of the district court. *Fromson*, 853 F.2d at 1576.

Insituform maintains that "it would have been reasonable for ITI,... to have agreed, in hypothetical negotiations with [CAT] . . . for a royalty figure of 20.5 %." (Plaintiffs' Revised Proposed Findings of Fact and Conclusions of Law, Instrument No. at 11). This figure was computed by adding one-half of the 8% royalty Insituform would have received from an Insituform licensee plus the 9% defacto royalty from ITI's sale of liners to

Insituform licensees to the 12% penalty ("Crossover") Insituform would have been required to pay under the terms of the license agreement to the licensee whose territory Defendants would have invaded if they were authorized Insituform licensees.[8]

Defendants, on the other hand, argue that "the ready availability of a non-infringing, substitute method for impregnating the resin would favor a low royalty rate." (Defendants, Trial Brief, Instrument No. at 11). As further support for their claim a low royalty rate should be used, Defendants produced evidence which Defen-

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[8] Under the Insituform License Agreement, the licensee was required to pay as a royalty "8% of the gross contract price of all contracts performed by [the licensee] utilizing the Subject Matter" defined as:

> all methods, apparatus and materials used in the lining of sewers, tunnels, pipelines, and other passageways (excepting those used to carry aronatice hydrocarbons in a gaseous state) by impregnating an absorbent layer with a synthetic resin, and retaining such layer in place in such passageway while the layer cures or is cured, and including all matters relating to the preparation, installation and completion of said lining." (Plaintiffs' Ex. 18A).

The agreement also provides that the licensee was "granted exclusive licenses for the exploitation of the Insituform process in certain defined territories" and that should a licensee:

> seek to exploit the Subject Matter outside of its exclusive Territory and in an area where an exclusive license has already been granted, [licensee] shall make a crossover payment of 12% of the gross contract price of all installations utilizing the Subject Matter in such areas in addition to the normal royalty payable to INAC ... Such crossover payment shall be paid by [Licensee] to INAC who shall in turn credit such crossover payment to the licensee in whose territory the installation was performed.

Id.

dants claim indicates that Insituform itself did not highly value the '012 patent. Defendants assert that Insituform licensees payed the same royalty rate-8%-both before and after the issuance of the '012 patent, which, according to Defendants, means that Insituform licensees essentially "received the right to practice the '012 method at no additional charge." (Defendants' Amended Requested Findings of Fact and Conclusions of Law, Instrument No. at 16). Defendants further argue that approximately 7/8 of the 8% royalty rate paid by Insituform licenses was to compensate Insituform for "trademark rights, marketing, advertising and know-how, and the 'inversion' technology". *Id.* This left, in Defendants' opinion, only "1 % to be apportioned among a variety of other patents licensed to [Insituform] licensees." *Id.* Moreover, Defendants claim that a higher royalty rate would be unreasonable in light of the fact that "CAT's consolidated margin on CIPP [cured in place pipe] over the five years in issue was 9.72%". *Id.* Defendants contend that the "notion that a party with a 9.72 % margin would pay 20.5 % of its gross revenues as a royalty. . . is palpably absurd." *Id.*

At trial, Phillip Farley ("Farley") of IGS testified that of the 8% royalty paid by Insituform licensees, 4% is attributable to the use of the Insituform name and the national advertising provided by Insituform.[9] The re-

[9] The 8% royalty rate under the terms of Insituforim License Agreements was computed based on the "gross contract price of all contracts. . . ." (Plaintiffs' Ex. 18A). The gross contract price included "the cost of all raw materials necessary to complete the installation of the Subject Matter" and "the value of any actual, preparatory and/or finishing work performed by any subcontractor or independent contractor . . . when such actual, preparatory and/or finishing work is performed as a part of and/or adjunct to the installation and use of the Subject Matter." *Id.*

maining 4%, Farley stated, was allocated between the technical and engineering support provided by Insituform and the patented technology. Farley also testified that other Insituform employees apportioned the royalty rate in a different manner than he did.

Plaintiffs' expert, Robert Goldscheider stated that because Insituform "had already granted a number of exclusive territorial licenses that included the '012 patent in the entirety of the United States" the "hypothetical negotiators needed to consider themselves subject to the 'crossover' provisions of the [INAC] sublicensees." (Plaintiffs' Ex. 15 at 6). Goldscheider also stated that Insituform licenses:

> grant rights to several patents in addition to the '012, and also include rights to know-how, copyrights, and the trademark "Insituform". There is no provision for apportionment of the royalties among these various rights, meaning that the full royalty rates are applicable if any of the licensed rights is used by a sublicensee.

Id.

In addition to considering the Crossover and the fact that Insituform did not apportion its royalty amongst the various rights it provided its licensees, Goldscheider claimed that the "sale of materials from a licensor to its licensees is common in licensing arrangements" and in the instant case, ITI's profits from the sale of customized liners to its licensees, which it would realize if CAT/Inliner were licensed, should be considered "as additional *defacto* royalties." *Id.* at 8. The liners, Goldscheider testified, together with the resin and the various steps involved in impregnation and installation, 'constitute a functional unit' so as to qualify for the entire market

rule set forth in *Rite-Hite Corporation et al. v Kelley Company, Inc.*, 56 F.3d 1538 (1995)." *Id.* at 8. Goldscheider stated that "the amount of ITI's profits from liner sales ancillary to (or part of the 'entire market value' of) CIPP projects . . . has been calculated to be equivalent to a 9% royalty rate on total contract price." *Id.* at 13. Moreover, Goldscheider testified that contrary to Defendants' contentions, there were no available alternatives to the Insituform process at the time of infringement and that, relying upon the holding in *Panduit Corp. v. Stahlin Bros. Fibre Works, Inc.*, 575 F.2d 1152 (6th Cir. 1987), "the subsequent appearance of a possible non-infringing alternative *after* a finding of infringement does not destroy the advantage recognition attributable to the patent during prior years". *Id.* at 7 (emphasis in original). Based on these factors, Goldscheider surmised that "the yardstick provided in [the] Rite-Hite case to the effect that an unwilling patentee would license a competitor for no less than one-half of its expected lost profits" would be applicable in this case and that a reasonable royalty in light of this standard and the aforementioned factors would be 50% of the 17% figure reflecting the 8% royalty and the 9% de facto royalty related to ITI's profits on the sale of liners added to the 12% crossover fee.[10]

Defendants' expert, Walter Bratic ("Bratic"), in his report claimed that under Insituform's License Agreement, each licensee had the right to:

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[10] In *Rite-Hite*, the Federal Circuit held that the district court made "no legal error" and "was not clearly erroneous" in awarding a reasonable royalty equal to approximately fifty percent of Rite-Hite's estimated lost profits. *Rite-Hite*, 56 F.3d at 1555.

> —use the technologies embodied in a number of patents (typically 6 to 15 patents, depending upon the date of the sub-license agreement) used in the Insituform Process, including the '012 Patent subsequent to its issue date;
>
> —use the name "Insituform"
>
> —receive training and on-going technical support relating to the Insituform Process;
>
> —benefit from future [Research and Development] efforts of Insituform

(Defendants' Ex. 19 at 6-7). Bratic also reported that "[t]he technology embodied in the '012 Patent does not create a new or separately identifiable product nor does it independently add sales value to the ultimate consumer" or "to the end product"; that "there is no customary profit specifically related to the selling of the invention; and that "Cat/Inliner could have performed its CIPP projects with no significant increase in cost without infringing the '012 patent. *Id.* at 7-9. Based on these findings, Bratic concluded that:

> It is likely that [Insituform] and Inliner would have entered into a nonexclusive sub-license agreement solely for the use of the '012 Patent for a royalty of substantially less than 8%. [Insituform's] typical sub-license agreements effectively provided the sublicenser with the technology (i.e., right to use up to 15 different patents), know-how, training and other rights and services to perform the entire Insituform Process and called for a royalty of 8 % . . . . Cat/Inliner had no need for the right to use any of [Insituform's] patents other than the '012 Patent, did not require additional know-how or training

> and did not desire to use the Insituform name ..... Therefore, one method of determining a reasonable royalty rate is to allocate the 8% royalty typically charged by [Insituform] to its sub-licensees for a comprehensive "basket" of technologies, know-how, training, etc. to the specific processes covered [and] . . . . only a small portion could be allocated to the '012 Patent.

(Defendants' Ex. 19 at 10).

Defendants have presented a creative but unpersuasive argument that the 8 % royalty rate paid by Insituform licensees should be apportioned amongst the different components of the patented technology. Without presenting any evidence to support such view, Defendants argue that the '012 patent should be valued, at the most, at 1 % of the royalty amount. There is no provision in Insituform's licensing agreement which would permit a licensee to select for its use only certain portions of the patented technology while excluding the remainder for a discounted royalty rate. Defendants have presented a fantastical argument that they could negotiate a different royalty rate than that assigned to all other licensees based on how much value they place on the part of the patented technology they want to use. Defendants' expert calculated damages that are numerically accurate but factually erroneous because such calculations were based on Defendants' premise that the royalty rate attributable to the '012 patent should be 1 %. This rate, however, has no basis in the evidence and was merely a litigation afterthought by the Defendants offered to minimize Plaintiffs' damages.

The Court also finds that there were no available alternatives for the Insituform Process at the time of

infringement. The Everson method, which Defendants' claim to be an acceptable alternative, was not suitable for use on pipes of longer length. Not only did vacuum impregnation using the Everson method take much longer to compete than the Insituform process, it also required a larger suction compressor than was otherwise necessary. Edward Smith, an engineer with Insituform, testified that it would take at least 8 hours to complete the impregnation process using the Everson method whereas with the Insituform Process it would take just a few minutes. "A product lacking the advantages of that patented can hardly be termed a substitute 'acceptable' to the customer who wants those advantages." *Panduit*, 572 P.2d at 1162. The Court finds that the overall operational efficiency of the Insituform Process provided the user thereof with significant advantages not obtainable through the use of the Everson method. In fact, at the time of infringement, the Insituform Process was the method of choice in CIPP work and used almost exclusively by Insituform and Defendants. These benefits of a more efficient process including its cost advantages are directly attributable to the patented technology and have contributed significantly to the popularity and commercial success of the Insituform Process.

Defendants argue that "another [acceptable noninfringing method] was the 'omit the duct tape' method (Process 3] recommended by Inliner on or about October 3, 1995, immediately after this Court's finding of infringement and stipulated by the plaintiffs to be non-infringing." (Defendants' Trial Brief at 9). However, as the court in *Panduit* found "[t]he post-hoc circumstance that [Defendants], when finally forced to obey the court's injunction, was successful in 'switching

. . . to a noninfringing [process], does not destroy the advantage-recognition attributable to the patent over the prior. . . years." *Panduit*, 575 F.2d at 1162.

Furthermore, the fact that Insituform and Defendants are competitors strengthens the patent owner's bargaining position and weighs against fixing a lower royalty rate. *see Rite-Hite v. Kelley Co., Inc.*, 774 F.Supp. 1514, 1543 (E.D. Wis. 1991) ("Where. . the plaintiffs and defendant are competitors, the patent holder will be entitled to a higher royalty rate"), *vacated in part on other grounds by* 56 F.3d 1538 (Fed. Cir. 1995); CHISUM, *supra* at §20.03 (stating that the patent owner's bargaining power would be greater if it was a competitor of the infringer). The Court also finds that, contrary to Bratic's report, the '012 does have value independent of Insituform's other patents. Sequential vacuum impregnation under the '012 is, as stated earlier, more efficient and cost effective than other technology available at the time of infringement. In fact, the City of Houston required that sewer rehabilitation in the Sims-Bayou Collection System be "accomplished by the use of the 'Insituform Process' or an approved equal." (Plaintiffs' Ex. 25A).

Another relevant factor is the collateral benefits Insituform received from the patented technology such as ITI's profits from liner sales ancillary to CIPP projects. *See Jenn-Air Corp. v. Penn Ventilator Co. Inc.*, 394 F.Supp. 665, 668 (E.D. Pa. 1975) ("The fact that a licensee would be able to sell the related non-infringing products would be a significant consideration in the hypothetical negotiations between a willing licensor and a willing licensee."). Under the entire market rule, a patentee is entitled to damages from the sale of unpatented components sold with a patented apparatus

when "the patent-related feature is the 'basis for customer demand.'" *Rite-Hite*, 56 F.3d at 1549 (quoting *State Industries, Inc. v. Mor-For Industries, Inc.*, 883 F.2d 1573, 1580 (Fed. Cir. 1989)). Therefore, for the entire market rule to apply, "the unpatented components must function together with the patented component of a single assembly or be parts of a complete machine, or they must constitute a functional unit." *Id.* at 1550. The Court finds that the various steps (including the products used in the performance of these steps) involved in the impregnation process, such as inverting the pipe with a tubular liner, cannot be considered in isolation but must be considered as a "functional unit", thereby entitling BV to include in the damage computation for reasonable royalty purposes ITI's profits on liner sales.

In addition to the above, however, the Court must also consider the following. Although the '012 patent has value and worth apart from Insituform's other patents, it is questionable whether Insituform had the capacity to perform all of the work Defendants completed with the use of the infringing processes. Steve McElyea, an engineer employed by Insituform from 1990 until 1994, testified that at the time of infringement there was tremendous growth in the CIPP industry and that IGS was not staffed to satisfactorily complete more projects than it had then undertaken. Sam Ellis ("Ellis"), a former Insituform employee, testified that there were, in the performance of certain jobs between 1990 and 1995, substantial delays due to a lack of skilled personnel and equipment necessary to complete the pipe rehabilitation procedure. Clearly, Insituform's relative bargaining strength decreases in absence of proof establishing that it had the capacity to perform the infringing

production. *Syntex (U.S.A.) Inc. v. Paragon Optical Inc.*, 8 USPQ2d 1001, 1026-27 (D. Ariz. 1987) (stating that since the exclusive licensee under the patent had the capacity to meet the demand the infringer "would have been desperate for a license"); CHISUM, *supra* at § 20.03[3] (stating that the patent owner's bargaining strength would be greater if it "had capacity to make the infringing sales or production"). This is in turn could have a bearing on the range of the reasonable crossover fee recoverable by BV.

C.J. Smith, the Director of Public Works for the City of Houston, testified that the City preferred, but did not mandate, competitive bidding and that in some instances the City would not award a contract unless more than one bid had been submitted for the job. Thus, CAT/Inliner's presence as a competitor to Insituform may have had the effect of increasing the overall number of possible CIPP jobs or at a minimum, expedited the procedure by which a municipality awarded CIPP contracts. Finally, Bratic testified that CAT/Inliner's anticipated gross margin from CIPP installations at the time of infringement was 25% and actual gross margin was 9.72%, rendering it almost fiscally impossible for CAT/Inliner to have, over the period of infringement, paid a high royalty rate.

With respect to the damages sustained by Insituform based on lost profits on jobs performed by CAT/Inliner, the Court has already determined that the actual profits which would have been recoverable by IGS cannot be considered due to lack of standing. There are three other components to those damages, however, that are recoverable by the patent owner—the defacto royalty from lost profits on the liners (under the entire market rule),

the royalty that it would have received had the infringer been licensed and any reasonable crossover fee.

In assessing the royalty base, Insituform has proposed that the value of the contracts awarded to CAT instead of IGS, its own licensee, is $50,212,379. (Plaintiffs' Ex 61, Schedule A-5). Defendants proposed total is $43,073,367 which according to Defendants expert, Bratic, does not include jobs after 10-3-95 when CAT began using the non-infringing Process 3. (Defendants' Ex. 21, Analysis of Reasonable Royalty Chart). The figures provided by both parties included jobs performed using Process 2 which has been determined to be non-infringing by the Federal Circuit. Accordingly, it is necessary for this Court to determine the value of the contracts involving Process 1 only.

In the Findings of Fact and Conclusions of Law issued by this Court on December 31, 1996, this Court found that Defendants switched to Process 2 sometime after June of 1991 (Instrument No. 372 p. 43). This finding was based on testimony from Mr. Catallo at the June 1991 trial, that the suction cup process was still being utilized. No specific finding was made by the Court in the Findings of Fact and Conclusions of Law issued in December of 1996 about the exact date after June of 1991 when the switch to Process 2 occurred as the Court had determined in those findings that both Process 1 and Process 2 were infringing. The opinion issued by the Federal Circuit in November of 1998, which concluded that Process 2 did not infringe claim 1 of the '012 patent, necessitates that this Court try to determine an exact date when Defendants switched to the use of needles for production.

Defendants argued after the Court issued its findings of December 1996 that the Court should revise its findings based on the February 1995 trial testimony of Mr. Catallo that CAT had shifted to needles exclusively by March of 1991. The Court did not find that testimony by Mr. Catallo credible then, and it does not find that testimony credible now. At the September 1997 trial on damages, Mr. Catallo was challenged about the inconsistency between his answers given at the original trial in June 1991 and the second trial on liability held in February of 1995. When pressed to reconcile this obviously conflicting and very important testimony, Mr. Catallo stated that cups were being used for production during 1991 but claimed that the company had "started looking at needles and started to use needles before the end of the year." The Defendants have pointed the Court to Mr. Catallo's November 10, 1998 deposition to corroborate this version of the events. As stated earlier, the Court has more faith in Mr. Cattalo's June 1991 version of the events than it does in any subsequent version that appears to have been generated as a litigation afterthought to minimize the Defendants' damages.

Furthermore, the depositions of the other two witnesses offered to corroborate Mr. Catallo's testimony, Robert C. Davis and Robert Hanna do nothing to persuade the Court that needles were actually being used for production purposes during the first quarter of 1991. While both witnesses confirmed that needles were being used in early 1991, neither verifies that needles were actually being used for production, a distinction that even Mr. Catallo had to acknowledge, at the September 1997 trial. The totality of the testimony of these witnesses does make it appear credible that Defendants had switched to needles for production by the end of

1991, however. Therefore, for purposes of these damage calculations, the court finds that a preponderance of the evidence necessitates that the Court enter a finding that Defendants had switched to the use of Process 2 for production by the beginning of 1992. Accordingly, only those CAT Contracting jobs performed through 1991 will be considered for purposes of determining the value of the contracts awarded to CAT instead of IGS. Those contract amounts total $9,313,341.[11]

The parties disagree on the calculation of the royalty base to be applied to that figure. All parties agree that deductions of 14.63 % from the contract total are reasonable. Defendants believe that an additional 12.12% of costs attributable to other work performed as part of the wet out or rehabilitation process should be deducted, including cleaning, remote camera inspection, trimming the end and inspecting the entire length of the pipe at the conclusion of the job. The Court disagrees. These costs are attributable to functions which are clearly a necessary and integral part of the overall patented process. The Court finds that under the entire market rule, it is not reasonable to exclude the costs of these additional items from the contracts in calculating the royalty base. Accordingly, the Court will use a royalty base of 85.37%. The royalty base rate of 85.37% multiplied by the value of contracts lost of $9,313,341 results in a royalty base of $7,950,799.

In computing the reasonable royalty, Insituform's expert, Goldscheider, stated that an appropriate measure of damages would be equivalent to one half of the

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[11] (See Plaintiffs' Appendix to Motion to Amend, Instrument No. 503, Exh. 38-Damages Computations: Contracts 890012 through 17; 900019 and 26; and 910021 through 23).

total sum of the 8% royalty plus the 9% defacto royalty rate. That amount would then be added to the 12% Crossover fee, yielding a royalty rate of 20.5 %.

In determining the reasonableness of royalty, courts give considerable weight to evidence of the anticipated profits the infringer would have derived from the use of the patented technology. *Faulkner v. Gibbs*, 199 F.2d 635, 640 (9th Cir. 1952) (holding that "the gross receipts and profits of the infringer are considered" in assessing a reasonable royalty). Evidence of actual profits may also be considered. *Trell v. Marlee Electronics Corp*. 912 F.2d 1443, 1446 (Fed. Cir. 1990). However, "the reasonable royalty rated does not reflect the infringer's actual profits, but rather the parties' expectations and bargaining positions at the time of the first infringement." *Micro Motion Inc. v. Exac Corp.*, 716 F.Supp. 1420, 1434; *see TWM Mfg. Co. Inc. v. Dura Corp.*, 789 F.2d 895, 899 (Fed. Cir. 1986) ("Although evidence of actual profits is generally admissible,. . the district court correctly focused on the date when the infringement began. "). "If a rule were to be applied limiting post-infringement court determination of royalties to the infringer's actual profits, the effect would be to insure the infringer against losses in those situations where actual profits are less than the royalty level that would have been freely negotiated prior to the infringement." *Paper Convening Mach. Co. v. FMC Corp.*, 432 F.Supp. 907, 916 (E.D. Wis. 1977). The Court may not, though, overlook the fact that it is "implicit in the 'reasonable royalty' methodology that the infringer would be left with a reasonable profit...." *Century Wrecker v. E.R. Buske Mfg. Co. Inc.*, 898 F.Supp. 1334, 1337-38 (N.D. Iowa 1995); see also *Zegers v. Zegers*, 458 F.2d 726, 728 n. 8 (7th Cir. 1972) (stating that it is unreasonable to as-

sume that the infringer "would be willing to pay 100% of his [anticipated] profits to the patentee in exchange for a license"); *W.L. Gore & Associates, Inc. v. International Medical Prosthetics Research Associates, Inc.*, 16 USPQ2d 1241, 1257 (D. Ariz. 1990) ("In a free market, a willing licensee would not agree to a royalty that exceeded anticipated profits."). Moreover, "the fact that, as events unfurled after the hypothetical royalty negotiations, the defendant would not actually have made a profit paying the royalty so determined is irrelevant." *Century Wrecker,* 898 F.Supp at 1337-38.

Bratic testified that the anticipated gross profits at the time this contract would have been negotiated were 25 %. Although CAT/Inliner's actual gross profits turned out to be only 9.72 %, the Court is not bound to use that figure in determining what would have been a reasonable royalty rate. *Century Wrecker*, 898 F.Supp at 1337-38. The Court does find the actual gross profit figure useful, however, in determining what might have been a reasonable royalty rate at the time negotiations would have taken place. As anticipated profits were 25%, the Court is bound to consider that as the upper limit in determining what a reasonable royalty rate might have been. *See* COLLIER'S, *supra* at §20.03[3] (stating that 'it is usually error to award all of the anticipated profits to the patent owner because a licensee would only enter into a hypothetical license on the supposition that he would make a reasonable profit"). The Court must also consider what would have been a reasonable profit for the infringer to make and finds the historical figure that has been provided here helpful in that regard. Assuming that 9.72 % would have been a reasonable profit and that anticipated gross profits were 25 % at the time, the Court finds that a reasonable royalty rate would have

been 15.28 %. Accordingly, the Court finds that damages should be calculated by multiplying the reasonable royalty rate of 15.28 % times the royalty base of $7,950,799, for actual damages related to the Gulf Coast Market of $1,214,882. [12]

With respect to the Sims-Bayou Contracts, the parties have stipulated that Process One was used by CAT/Inliner and Michigan Sewer in the performance of the Sims Bayou Contracts and that CAT/Inliner and Michigan Sewer are jointly and severly liable for any damages caused as a result such infringement. Michigan Sewer is jointly and severally liable with CAT/Inliner only for the jobs in which they were involved. The evidence shows that Michigan Sewer was involved in only four contracts which were performed in 1990 and 1991. The total revenue on those jobs was $5,967,647. Applying the royalty base rate of 85.37% results in a reasonable royalty base of $5,094,580. Applying the same reasonable royalty rate of 15.28%, the damages for which Michigan is jointly and severally liable are $778,452. Prejudgment interest on that amount only is $932,110.[13]

B. Remainder of the United States Market (Active Inducement Liability)

Section 271(b) of the Patent Act provides that "whoever actively induces infringement of a patent shall be

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[12] Damages will not be assessed against Americas, which was added by the permission of the Court after the 1995 trial, since there is no evidence in the record to show that Americas either directly infringed the '012 patent or induced the infringement of its licensees.

[13] The recovery of prejudgment interest is discussed in detail in section V part E of this opinion.

liable as an infringer." 35 U.S.C. § 271(b). A defendant induces infringement under section 271(b) "by actively and knowingly aiding and abetting another's direct infringement." *C.R. Bard, Inc. v. Advanced Cardiovascular Systems, Inc.*, 911 F.2d 670, 674 (Fed. Cir. 1990). Absent proof that the defendant "possessed specific intent to encourage another's infringement and not merely that the defendant had knowledge of the acts alleged to constitute infringement" there can be no liability for active inducement under section 271. *Manville Sales Corp v. Paramount System% Inc.*, 917 F.2d 544, 553 (Fed. Cir. 1990); *see also Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469 (Fed. Cir. 1990) (holding that "proof of actual intent to cause the acts which constitute infringement is a necessary prerequisite to finding active inducement") .

To satisfy the intent requirement, the plaintiff must show "the alleged infringer's actions induced infringing acts and that he knew or should have known his actions would induce actual infringement. *Manville*, 917 F.2d at 553 (emphasis in original). Thus, a plaintiff cannot prevail on a claim for inducement unless he can show the following: "(1) an inducer's knowledge of the asserted patent; (2) the presence of direct infringement by the third party allegedly induced; [and] (3) an inducer's actual intent to cause the acts which 'he knew or should have known would induce actual infringement.' " *Black & Decker (US) Inc. v. Catalina Lighting, Inc.*, 9 5 3 F. Supp. 13 4, 13 8 (E.D. Va. 1997); *see also Young Dental Manufacturing Co. v. Q3 Special Products, Inc.*, 891 F.Supp. 1345, 1348 (E.D. MO. 1995) (holding that to show the defendant actively induced infringement the plaintiff must show both " an act by the alleged defendant knowingly intended to induce another to infringe" and "the actual infringement by the third party").

1. KM

KM argues that Plaintiffs have faded to prove that it possessed the requisite mental state for inducement liability. KM asserts that it "did not know of the existence of the '012 patent prior to February 2, 1990, the filing date of the lawsuit" and that, as a result of this lack of knowledge, the Court cannot consider following acts as proof of inducement:

> (1) [t]he demonstration in Germany of the two cup German Inliner vacuum impregnation technique, which occurred in early March, 1989; (2) [t]he March 17, 1989, Letter of Intent between Kanalsanierung and... and Cat respectively; (3) the unexecuted license agreements between Kanalsanierung and Cat and (4) [t]he 'To Whom It May Concern' letter, which is dated November 10, 1989." (Defendant Kanalsanierung Hans Mueller GmbH & Co, KG's Motion for Judgment on Partial Findings, Instrument No. 450 at 5-6) (citations omitted). Moreover, KM contends that after "January 1, 1990, the responsibility and authority for licensing the German Inliner process was transferred from Kanalsanierung to a different company, [KMG]," which is not a party to this suit. *Id.* at 8. Finally, KM maintains it did not have knowledge of or control over CAT's development of Process 2 and thus, could not have "intended to cause the acts (using the Multiple needle vacuum impregnation technique) that constitute[d] the infringement of the '012 patent." *Id.* at 9.

Insituform argues that "[[i]t makes no difference, from a scienter point of view, whether the German defendant was aware of the specific identity of each of

the relevant Insituform patents. It is sufficient that it knew that Insituform had United States patents which would very likely be infringed." (Plaintiffs' Answer to Defendant Kanal Sanierung's Motion for Judgment on Partial Findings, Instrument No. 455 at 3). Moreover, Plaintiffs claim that "[w]hether needles or cups were used" is "totally irrelevant." *Id.* at 4. "[I]t was sequential vacuumization which the German defendant induced Cat/Inliner to carry out, and it is sequential vacuumization which is the subject matter of the '012 patent." *Id.*

The evidence in the record shows that KM informed Catallo of its prior patent litigation with Insituform and advised Catallo to obtain legal advice regarding the possibility for infringement of the United States' counterparts to Insituform's European patents. The process KM taught CAT/Inliner did not infringe Insituform's European patents and there is no evidence that KM was aware of or should have been aware of Insituform's patent situation in the United States. Nor is there any basis to conclude that KM could reasonably foresee that a variation of the process it taught CAT/Inliner would be infringing in the United States. "[I]t is clear under section 271(b) an accused infringer must be shown to have actual knowledge of the patent and the infringement and have the actual intent to induce the infringement." *Dynamics Inc. v. Leepoxy Plastics, Inc.*, 831 F.Supp. 65 1, 657 (N.D. Ind. 1993); *see also State Industries, Inc. v. A. 0. Smith Corp.*, 7 51 F. 2d 1226, 1236 (Fed. Cir. 1985) ("To willfully infringe a patent, the patent must exist and one must have knowledge of it."). Absent such proof, KM cannot be held liable for active inducement.

The Court however, must consider whether KM is the alter ego of KMG, a separate corporation that licensed the infringing technology to Inliner after KM received notice of the '012 patent, and whether KM is, therefore, vicariously liable for inducement.

Under Texas law, a finding by the Court that KM is the alter ego of KMG permits the Court "to disregard the corporate fiction and pierce the corporate veil, thereby attributing" KMG's infringing conduct to KM. *Gundlee Lining Constr. Corp. v. Adams County Asphalt, Inc.*, 85 F.3d 201, 208 (5th Cir. 1996); *Stuart v. Spademan*, 772 F.2d 1185, 1197 (5th Cir. 1995). The "[a]lter ego doctrine applies when 'there is such unity between corporation and ... [entity] that the separateness of the corporation has ceased . . . .'" *Permian Petroleum Co. v. Petroleos Medcanos*, 934 F.2d 635, 643 (5th Cir. 1991) (quoting *Castleberry v. Branscum*, 721 S.W.2d 270, 272 (Tex. 1986)). In other words, under the alter ego theory, the court may disregard the corporate form "'where a corporation is organized and operated as a mere tool or business conduit' " for another entity. *Zahra Spiritual Trust v. United States,* 910 F.2d 240, 245 (5th Cir. 1990) (quoting *Castleberry,* 721 S.W.2d at 272).

In determining whether an entity is the alter ego of a corporation, the Fifth Circuit has held that the court should consider the total dealings of the corporation and the entity, including the degree to which their "property ha[s] been kept separately, the amount of financial interest, ownership and control the . . . [entity] maintains over the corporation, and whether the corporation has been used for ... [the entity's] purposes.'" *Zahra Spiritual*, 910 F.2d at 245 (quoting *Castleberry*, 721 S.W.2d at 272); *Gundle Lining,* 85 F.3d at 209. In addition, courts have utilized the following list of factors

when examining whether an entity is the alter ego of a corporation:

(1) the corporation is undercapitalized;

(2) without separate books;

(3) its finances are not kept separate from the entity's finances, the entity's obligations are paid by the corporation;

(4) the corporation is used to promote fraud or illegality;

(5) corporate formalities are not followed; or

(6) the corporation is merely a sham.

Stuart, 772 F.2d at 1197 (quoting *Lakota Girl Scout Council, Inc. v. Havey Fund-Raising Management, Inc.*, 519 F.2d 634 (8th Cir. 1975)).[14] "Resolution of alter ego issues must be based on a consideration of 'the totality of the circumstances.'" *Gundle Lining*, 85 F.3d at 209 (quoting *United States v. Jon-T Chemicals, Inc.*, 768 F.2d 686, 694 (5th Cir. 1985)). Furthermore, "Texas courts will not apply the alter ego doctrine to directly . . . pierce the corporate veil unless one of the 'alter egos' owns stock in the other." *Permian*, 934 F.2d at 643.

In support of their argument that KM is the alter ego of KMG, Insituform states the following:

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[14]In 1989, the Texas legislature amended the Business Corporation Act, by removing "failure to observe corporate formalities" from the list of factors used in proving alter ego theories. See TEX. Bus. CORP. art. 21.21 A(3); *GundLe Lining*, 85 F.3d at 209 n.4. Therefore, this Court will not consider the fourth factor in its analysis. *See Gundle Lining*, 85 F.3d at 209 n.4.

(1) KM and KMG are both 100% owned by Hans Mueller.

(2) In 1989, KM held itself out as the owner and licensor of the '562 patent but in July of 1990, KMG held itself out to be the owner and licensor, although legal title remained at all times in Hans Mueller.

(3) The German defendants actively participated in and were represented by counsel in this litigation throughout its history, and all defendants, German and domestic, used the term "Kanal-Mueller" to identify both the German defendants and the German licensor.

(Instrument No. 502, at 17). Insituform contends that "[t]his is far more than enough to impart knowledge" by KMG to M (*Id.*). The Court does not agree.

The evidence does not show that either KM or KMG owned stock in the other at any relevant time. Nor did Insituform present any proof that KM and KMG failed to follow separate corporate formalities. In fact, Insituform does not submit any evidence relevant to the factors listed above. Absent such proof, KM cannot be held as the alter ego of KMG.

2. CAT/Inliner

Defendants argue that there is no evidence from which it can be determined that their licensees used the infringing process or that they induced such infringement. In an effort to secure this proof, Insituform prepared a questionnaire to be propounded to the licens-

ees.[15] To encourage the licensees to answer those questionnaires the parties entered on January 7, 1997, into certain stipulations designed to resolve some disputed fact issues. The parties stipulated to the following:

> Before October 3, 1995, Inliner taught Process 2 (as defined in the court's Findings of Fact) to all of its licensees as part of its obligation under its license agreements with those licensees and recommended the use of that process. Inliner believes that its licensees have used that process for all but relatively short liner lengths (where it is thought that the Everson Process was used) in connection with work on which the licensees paid royalties to Inliner, that such has been the case on those occasions when Inliner personnel have observed or been informed with respect to licensee activities, and for purposes of this proceeding and for all other purposes it is stipulated that in each of the activities up to October 3, 1995 with respect to which the licensees paid royalties to Inliner Process 2 was employed at least to some extent, unless the contrary is shown.
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> In October of 1995 Inliner taught all of its licensees a third process. . and recommended its use. Inliner believes that its licensees have used that

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[15] The questionnaire originally had eight questions. However, in the parties' stipulation they agreed that "for purposes of this litigation the answers to the same information [contained in question 8] from Inliner and Cat will be used for the Licensees information as wen, just as if the Licensees had answered Question No. 8. Question 8 contained the following subpart: "Percentage of Impregnation Done via Process 2. " (Plaintiffs' Ex. 22).

> third process to the exclusion of Process 2 in connection with work on which licensees paid royalties to Inliner, that such has been the case on those occasions when Inliner personnel have observed or been informed with respect to licensee activities, and for purposes of this proceeding and for no other purposes, it is stipulated that in each activity subsequent to October 3, 1995 with respect to which the licensees paid royalties to Inliner that third process was employed and Process 2 was not employed, unless the contrary is shown.

(Plaintiffs' Ex. 22). The parties further agreed that "[i]f any licensee does not cooperate in voluntarily providing the requested information, then the parties agree that the questions will be posed via deposition on written question or oral deposition as counsel may choose." (Plaintiffs" Ex. 22 at 2).

The responses to the questionnaires were admittedly less than satisfactory. The Court believes that this was due, in no small part, to the actions of Defendants in publishing statements in trade publications and in disseminating letters which implied that the findings of this Court would be reversed.[16] In one such letter, CAT/Inliner stated that:

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[16] On April 2, 1996, Insituform filed a motion to hold Defendants in contempt of the Court's injunction prohibiting the use of Process 1 or 2 in connection with any work done by Defendants and their licensees. On June 14, 1996, the Court held a hearing on Insituform's motion. At this time, Insituform brought to the Court's attention the fact that CAT/Inliner had circulated a press release within the financial community, published a journal article in a trade journal and distributed a memo amongst its licensees containing both unfounded allegations concerning conduct on the part of Insituform which Defendants deemed to be

Continued on next page.

The United States Court of Appeals for the Federal Circuit ("CAFC") reached a decision in the appeal of the District Courts infringement findings, amount [sic] other things decided by the District Court. The CAFC affirmed the Court's findings and conclusions of no literal infringement from the 1991 trial. The CAFC also vacated the District Court's findings and conclusions relating to infringement under the Doctrine of Equivalents from the 1995 trial and remanded this same issue back to the District Court, with instructions regarding claim construction. This is great news. In essence, we won! However, the case is not over.

The practical effects of the CAFC decision are multifaceted and briefly explained below:

First, there is now no finding of infringement of the Insituform vacuum patent ("012"), literally or equivalently. Insituform cannot claim otherwise to your customers.

Second, the damages trial predicated upon infringement is now moot and all related activities will cease.

Footnote 16 continued.

fraudulent and misleading information regarding the validity of the Court's judgment of infringement and the potential for recovery of any damages. (Plaintiffs' Exs. 35-38). The Court pointed out that irreparable damage had already been done and admonished Defendants to cease any further attempt to manipulate public opinion, to negatively influence their licensees or otherwise lead them to noncompliance with Court orders or future discovery relating to the damages portion of the case.

> Third, the "Monitoring Order" that allows Insituform to inspect on a monthly basis is moot and all related activities will cease.

(Plaintiffs' Ex. 38) (emphasis added). As a direct result of these types of false and misleading statements, only two questionnaires were returned by CAT/Inliner licensees from which this Court can evaluate CAT/Inliner's. Because this limited statistical sampling was caused by no fault of Insituform, the Court will not, as Defendants have requested, limit Insituform's damage claim for lack of supporting proof. Instead, the Court will rely on these questionnaires in making its determination regarding the extent to which the licensees used the infringing methods and were induced to do so by the Defendants.

The questionnaires were submitted by Reynolds, Inc. ("Reynolds") and Lanzo Lining Systems, Inc. ("Lanzo Lining"). Reynolds lining admitted that it used Process 2 in all work it performed prior to October 3, 1995, and that Process 2 was taught to it by CAT/Inliner. Reynolds also listed the individual jobs in which Process 2 was used and the amount of royalties it paid to CAT/Inliner on such jobs. Lanzo Lining claimed to have used Process 1 in 100% of its contracts. However, in response to the following question:

> Was knowledge of the vacuum impregnation process or processes that were carried out imparted to you by CAT/Inliner or persons acting for CAT/Inliner, or was it information CAT/Inliner should have disclosed to you pursuant to the terms of the license agreement with them?

Lanzo stated that "We expected to get directives from Inliner representatives and we did." (Plaintiffs' Ex. 24).

While the parties stipulated that Defendants taught Process 2, they did not negate the possibility that Defendants also taught Process 1. In fact, the parties' stipulation was specifically limited by the statement "unless the contrary is shown". The response of their licensee, Lanzo Lining, clearly indicates that Defendant did teach or give directives about Process 1. Accordingly, the Court finds that the stipulations and statistical evidence, when taken together, show that Defendants taught their licensees both processes found to have been infringing by the Court and that at least 50% of their licensees used Process 1 and at least 50% of them used Process 2.

With respect to the damages sustained by Insituform based on lost profits on jobs performed by the Inliner licensees and on CAT contracting jobs outside of the Gulf Coast Market, Insituform asserts and the Court agrees that the royalty revenue totals $30,684,385 (CAT jobs totaling $1,344,372 and licensee jobs totaling $29,340,013. (Plaintiffs' Ex. 61, Schedule A-6, A-7 & A-8).[17] To that figure Insituform proposes using a reasonable royalty rate of 20.5 %. For the reasons states above, the Court will use a royalty rate of 15.28 %. However, since the Federal Circuit has found that only Process 1 is infringing and this Court has concluded that 50% of the licensees' activities involved Process 1, Insituform asserts and the Court agrees that "the amount of damages attributable to licensee activity ... should be cut in half." (Plaintiffs' Memo, Instrument No. 502, at 43). Based on the royalty rate of 15.28%, the Court finds that damages related to the work by CAT/Inliner licensees

[17] The CAT contracting figure reflected on schedule A-6 is incorrectly fisted as $1,574,759 instead of $1,344,372 - the royalty base amount.

and by CAT jobs outside of the Gulf Coast Market where they used Process 1 totals $2,344,287.

3. Michigan Sewer

There is no evidence in the record proving that Michigan Sewer actively induced others to infringe the '012 patent. As such, Michigan Sewer cannot not be held liable for inducement.

C. Enhanced Damages

Section 284 authorizes the court to "increase the damages up to three times the amount found or assessed." 35 U.S.C. § 294. The decision to award enhanced damages is "committed to the district court's discretion." *Spindelfabrik Sussen-Schurr Stahlecker & Grill v. Schubert & Salzer Maschinenfabrik Aktiengeselischaft*, 829 F.2d 1075, 1083-84 (Fed. Cir. 1987). However, "[i]n order to support such an increased, punitive award there must be a finding that the infringement was willful. The existence of honest doubt concerning the validity of a patent precludes a finding of willfulness." *Eltra Corp. v. Basic Inc.*, 599 F.2d 745, 757 (6th Cir. 1979); *Enterprise Mfg. Co. v. Shakespeare Co.*, 141 F.2d 916, 921 (6th Cir. 1944) ("If honestly mistaken as to a reasonably debatable question of validity, an infringer should not be made to smart in punitive damages. Compensatory damages constitute adequate remuneration for invasion of a patentee's property rights, unless the refusal of the infringer to bow to the presumptive validity of an issued patent is consciously wrongful."). Furthermore, "[a]n increase in damages for willfulness... is generally inappropriate when the infringer mounts a good faith and substantial challenge to the existence of infringement." *Paper Converting Machine Co. v. Magna-Graphics Corp.*, 745 F.2d 11, 20 (Fed, Cir. 1984).

Whether infringement is willful is "by definition a question of the infringer's intent", which may be "resolved by evaluating the totality of the surrounding circumstances." *Ortho Pharmaceutical Corp. v. Smith*, 959 F.2d 936, 943 (Fed. Cir. 1992); *Gustafson, Inc. v. Intersystems Industrial Products*, 897 f.2d 508, 510-511 (Fed. Cir. 1990) ("Whether an act is 'willful' is by definition a question of the actor's intent, the answer to which must be inferred from all circumstances."). The following factors have been utilized in assessing the infringer's culpable state at the time of the infringement:

> (1) whether the infringer deliberately copied the ideas or design of another; (2) whether the infringer, when be knew of the other's patent protection, investigated the scope of the patent and formed a good-faith belief that it was invalid or that it was not infringer, and (3) the infringer's behavior as a party to the litigation.

Bott v. Four Star Corp., 807 F.2d 1567, 1572 (Fed. Cir. 1986); *see also National Presto Industries, Inc. v. West Bend Co.*, 76 F.3d 1185, 1193 (Fed. Cir. 1996) (stating that the following may be considered as factors in determining whether infringement was willful: "whether the infringer exercised care to respect the legal rights of the patentee, whether sound legal advice was timely obtained, whether the actions taken were reasonable, whether there was copying or independent development by the infringer, and various aspects of the actual relationship between the patentee and the infringer"). Other factors that may be considered are: "(4) [d]efendant's size and financial condition; (5) [c]loseness of the case; (6) [d]uration of defendant's misconduct; (7) [r]emedial action by the defendant's; (8) Defendant's

motivation for harm; [and] (9) [w]hether defendant attempted to conceal its misconduct." Read Corp. v. Portec, Inc., 970 F.2d 816, 827 (Fed. Cir. 1992).

Finally, the risk of a finding of willful infringement increases when a potential infringer fails to obtain legal advice prior to engaging in possible infringing activity. "Where . . . a potential infringer has actual notice of another's patent rights, he has an affirmative duty to exercise due care to determine whether or not he is infringing." *Underwater Devices Inc. v. Morrison-Knudsen Co.*, 717 F.2d 1380, 1389-1390 (Fed. Cir. 1983). This affirmative duty includes "the duty to seek and obtain competent legal advice from counsel *before* the initiation of any possible infringing activity." *Id.* at 1390. However, an opinion letter on validity or the failure to obtain such an opinion is not dispositive on the issue of willful infringement but must be considered in light of aforementioned factors.

Insituform contends that the following facts support its claim for enhanced damages: (1) CAT/Inliner failed to perform a index search at the U.S. Patent Office for patents owed by Insituform prior to commencing its infringing activity; (2) once it learned of the '012, CAT/Inliner did not obtain a written opinion regarding the possibility of infringement of the '012; (3) CAT/Inliner indemnified its licensees against all damages arising from infringement of the Insituform patent and such indemnification agreements were executed after the jury in the first trial found the '012 to be valid; (4) CAT/Inliner has engaged in "excessive and unjustified motion practice"; (5) CAT/Inliner's argument against infringement-that prosecution history of the '012 patent estopped Insituform from claiming infringement by Process 1 or 2 under the doctrine of equivalents-was

unreasonable and (6) CAT/Inliner published in trade and other similar journals distributed within the financial community false statements wrongfully accusing Insituform of engaging in fraudulent conduct, inaccurately describing the judgment rendered by the Federal Circuit and imparting misinformation regarding the potential for a new trial to be granted. (Plaintiffs' Consolidated Pretrial Memorandum at 50-54).

In contrast, CAT/Inliner argues that its acts, which the Court ultimately found to be infringing, "were carried out with the advice of counsel, and in the good faith belief that they did not constitute infringement or would not be found to be infringing". (Defendants' Motion for JMOL on Inducement to Infringe and Willfulness Issues, Instrument No. 443 at 3-4).

While CAT/Inliner are correct that a good faith belief of noninfringement precludes a finding of wilfulness, *see Eltra Corp v. Basic, Inc.*, 599 F.2d 745, 757-58 (6th Cir. 1979) ("The existence of honest doubt concerning the validity of a patent precludes a finding of wilfulness. "); *Yoder Bros. Inc. v. California-Florida Plant Corp.*, 537 F.2d 1347, 1383-84 (5th Cir. 1976) ("Where the issue of patentability is close and litigated in good faith, the court should be more reluctant to impose punitive damages."), the Court finds that the evidence in the record does not support CAT/Inliner's position that their conduct in infringing was based on their mistaken belief that neither Process 1 or 2 infringed the '012.

After suit was filed against CAT/Inliner alleging infringement of the '012 patent, Catallo testified that he obtained an oral opinion from Knoll that the process used by CAT/Inliner did not infringe the '012. Catallo never obtained, as he did with the '063 and '345 patents,

a more comprehensive evaluation or a written opinion regarding the '012 patent and CAT/Inliner's potential infringement thereof.[18] *See National Presto Industries Inc v West Bend Co.*, 76 F.3d 1195, 1193 (Fed. Cir. 1996) (finding wilfulness when, among other reasons, defendant did not timely obtain a written opinion regarding possible infringement). Catallo simply relied on Knoll's conclusion that the '012 was valid and unenforceable and his own personal belief that there was no infringement. "Obtaining a conclusory opinion of counsel letter after the manufacture of the infringing device and after a notice of infringement has been received from the patentee does not indicate good faith." *Dickey-John Corp. v. International Tapetronics Corp.*, 710 F.2d 329, 348 (Fed. Cir. 1983).

In *Underwater Devices Inc. v. Morrison-Knudsen Co.*, the Federal Circuit held that for an opinion of noninfringement to be competent it should, at a minimum, contain a patent validity analysis "explicitly predicated on a review of the file histories of the patent at issue, and an infringement analysis that, *inter alia,* compared and contrasted the potentially infringing method ... with the patented inventions." 717 F.2d 1380, 1390 (Fed. Cir. 1983); *see also Read*, 970 F.2d at 829 (stating that an opinion may be deemed incompetent when an attorney failed to "look[ ] into the necessary facts" because 'there would be no foundation for his opinion"). The opinion rendered in the instant case failed to meet this standard. Nor was there any proof that Knoll either evaluated the possibility that Process

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[18] The written opinion concerning the '063 and '211 was very detailed, containing a review of the prosecution history of the two patents and an analysis regarding both literal infringement and infringement under the doctrine of equivalents.

1 or 2 infringed under the doctrine of equivalents or consulted the '012 prosecution history before rendering her opinion. *See Datascope Corp. v. SAMC, Inc.*, 879 F.2d 820, 828 (Fed. Cir. 1989) (finding willfulness where the opinion at issue "said nothing whatever about the validity of the '339 patent or any Datascope patent, and the opinion's reference to infringement is not only conclusory, but ignores entirely the question of infringement under the doctrine of equivalents"). Had there been such an analysis, Knoll may have concluded as did the Federal Circuit in its November 6, 1996 opinion that "it cannot be said that a reasonable competitor could conclude that Insituform relinquished coverage of processes using either multiple vacuum sources or a continuous vacuum." (Instrument No. 368 at 20). Moreover, there is no evidence that the switch to Process 2 was based on anything other than Catallo's and Knoll's unsupported belief that using needles instead of cups would make infringement less likely. "An alleged infringer who intentionally blinds himself to the facts and law, continues to infringe, and employs the judicial process with no solidly-based expectation of success, can hardly be surprised when his infringement is found to be willful." *Kloster Speedsteel AB v. Crucible, Inc.*, 793 F.2d 1565, 1580 n.11 (Fed. Cir. 1986).

In addition, the Court finds that CAT/Inliner's bad faith conduct and improper litigation tactics further warrants a finding of willfulness. In February of 1996, CAT/Inliner released for publication various statements regarding this suit that were plainly incorrect and intentionally designed to not only to malign Insituform but also mislead readers as to the propriety of CAT/Inliner's continued use of technology covered by the '012 patent. In a press release dated February 23, 1996,

CAT/Inliner announces that it "has filed a motion for new trial based on newly discovered evidence and on the ground of fraud and misconduct by Insituform." CAT/Inliner then asserts that it "uncovered seemingly irrefutable evidence of deliberate concealment of damaging evidence by Insituform in its apparent efforts to create the perception of validity and enforceability of a United States Patent owned by Insituform." (Plaintiffs" Ex. 35). This evidence, CAT/Inliner proclaims, "supports [its] continuing argument that Insituform has flagrantly misrepresented the validity and enforceability of the patent and has repeatedly, and in an organized manner, used the patent to restrict free trade in the marketplace over the last sixteen years." *Id.* There was no legally sufficient evidence of these claims produced in the instant action and CAT/Inliner's motion for new trial (Instrument No. 276) was summarily denied on June 12, 1996. (Instrument No. 301). As stated earlier, the Court finds that this conduct on the part of CAT/Inliner was nothing more than a misguided attempt to redeem itself in the perception of public at the expense of Insituform's reputation and to withhold critical information regarding the actual nature of its activities over the preceding six years.

Therefore, due to a complete absence of competent advice regarding possible infringement of the '012 patent and a flagrant display of deliberate misconduct by CAT/Inliner throughout this proceeding, the Court finds that actions of CAT/Inliner's evidenced the degree of willfulness necessary to support the award of enhanced damages. The Court further finds that CAT/Inliner's willful behavior justifies a 50% increase in the actual damages award for a total additional award of $1,779,584.

D. Attorney's Fees

Under section 285, "[t]he court in exceptional cases may award reasonable attorney fees to the prevailing party." 35 U.S.C. § 285. An award of attorney's fees under this section is within the discretion of the trial court but such an award must be based on a specific finding of exceptional circumstances, which must be proven by clear and convincing evidence. *See Cambridge Products, Ltd. v. Penn Nutrients, Inc.*, 962 F.2d 1048, 1050 (Fed. Cir. 1992) (holding that "the exceptional nature of the case must be established by clear and convincing evidence); *Hughes v. Novi American, Inc.*, 724 F.2d 122, 124 (Fed. Cir. 1984) ("While an award of attorneys fees is to be reviewed under the standard of whether such award constitutes an abuse of discretion, an award must be set aside if it is unsupported by adequate findings of the basis for the award, thereby precluding meaningful review."); *Raytheon Co. v. Roper Corp.*, 724 F.2d 122, 124 (Fed. Cir. 1983) (holding that the court has the discretion to award attorney's fees).

"Exceptional circumstances" may include, but is not required to, willful or deliberate infringement or inequitable conduct engaged in by the defendant during litigation. *Avla Group International, Inc. v. L.A. Gear California, Inc.*, 853 F.2d 1557, 1567 (Fed. Cir. 1988) ("Although an award of attorney fees, because discretionary, does not automatically follow from the willfulness of an infringement. . . the willfulness of the infringement by the accused infringer may be a sufficient basis in a particular case for finding the case 'exceptional' for purposes of awarding attorney fees to the prevailing patent owner."); *Kahn v. Dynamics Corp. of America*, 508 F.2d 939, 944-45 (2d Cir. 1974). "Because [willfulness of infringement] may be seen as producing an

unnecessary and outcome-certain law suit, it may make the case so exceptional as to warrant attorney fees under § 285. Similarly, bad-faith displayed in pretrial and trial states, by counsel or party, may render the case exceptional under § 285." *Kloster Speedsteel, AB v. Crucible, Inc.*, 793 F.2d 1565, 1580 (Fed. Cir. 1986). However, the statute does not contemplate that "a prevailing alleged infringer should be treated as a 'private attorney general' for invalidating a 'fraudulent patent'. Rather, the purpose is to provide discretion where it would be *grossly unjust* that the winner be left to bear the burden of his own counsel which prevailing litigants normally bear." *J.P. Stevens Company, Inc. v. Lex Tex Ltd, Inc.*, 822 F.2d 1047,1052 (Fed. Cir. 1987); *see also Modine Manufacturing Co. v. Allen Group, Inc.*, 917 F.2d 538, 543 (Fed Cir. 1990) ("[T]he decision whether or not to award fees is still committed to the discretion of the trial judge, and '[e]ven an exceptional case does not require in all circumstances the award of attorney fees'".) (quoting *S.C. Johnson & Sons, Inc. v. Carter-Wallace, Inc., 781 F.2d 198, 201 (Fed. Cir. 1986)).* *In cases where there has been an express* finding of willfulness, the trial court must, in denying attorney fees, "explain why the case is not 'exceptional within the meaning of 35 U.S.C. Section 285." *Modine Manufacturing*, 917 F.2d at 543. The Court finds Insituform has, based on both CAT/Inliner's willful infringement and bad faith conduct during this trial, proven, by clear and convincing evidence, the exceptional nature of this case. *See Avia Group International, Inc. v. L.A. Gear California, Inc.*, 853 F.2d 1557, 1567 (Fed Cir. 1988) ("[T]he willfulness of the infringement by the accused infringer may be a sufficient basis in a particular case for finding the case 'exceptional' for purposes of awarding attorney fees to the prevailing patent owner."); *Kori Corp. v.*

Wilco Marsh Buggies & Draglines, Inc., 761 F.2d 649, 657 (Fed. Cir. 1985) ("Having found this to be a case of willful infringement, the district court's discretionary award of attorney fees and costs ... was proper). As such, this Court awards Insituform, as an extra measure of recovery, reasonable attorney fees.

On September 22, 1998, Insituform submitted its request for attorney fees and cost, totaling $1,642,952.50. (instrument No. 474). Based on this Court's Order of even date herewith, attorney's fees and costs are awarded in the amount of $806,501.25.

E. Prejudgment Interest

Insituform argues that they are "entitled to recover compounded pre-judgment interest at the prime rate." (Plaintiffs' Consolidated Pretrial Memorandum, Instrument No. at 55). In contrast, Defendants request that since "Insituform did almost nothing to prosecute its infringement suit from the time Judge Hughes granted a JNOV and new trial until the case was reassigned to this Court... the Court to exclude this time period from the computation of prejudgment interest." (Defendants' Trial Brief, Instrument No. at 21). In addition, Defendants "suggest that the Court employ the statutory rate for post-judgment interest set forth in 28 U.S.C. §1961" and "use a simple interest approach only." *Id.*[19]

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[19] Section 1961 provides in relevant part: [[I]nterest shall be calculated . . . at a rate equal to the coupon issue yield equivalent (as determined by the Secretary of the Treasury) of the average auction price for the last auction price for the last auction of fifty-two week United States Treasury bills settled immediately prior to the date of judgment.. . Interest shall be computed daily to the date of payment.... 28 U.S.C.§ 1961.

The district court has substantial discretion in determining whether prejudgment interest should be awarded, the rate of such interest and whether it should be compounded or uncompounded. *Datascope Corp. v. SMEC, Inc.*, 879 F.2d 820, 829 (Fed. Cir. 1989); *Bio-Rad Laboratories, Inc. v. Nicolet Instrument Corp.*, 807 F.2d 964, 969 (Fed. Cir. 1986). In exercising that discretion, the Court must be guided by the United States Supreme Court's decision in *General Motors v. Devex Corp*, 461 U.S. 648, 654, 103 S.Ct. 2058, 2062 (1983). In *Devex*, the Court held that "prejudgment interest should ordinarily be awarded" so as to fulfill section 284's overriding purpose of "affording patent owners complete compensation" and "ensur[ing] that the patent owner is placed in as good a position as he would have been had the infringer entered into a reasonable royalty agreement." *Id.* at 654, 103 S.Ct. at 2062. According to the Court, "[a]n award of interest from the time that the royalty payments would have been received merely serves to make the patent owner whole, since his damages consist not only of the value of the royalty payments but also of the foregone use of the money between the time of infringements and the date of the judgment." *Id.* In this case, the Court finds that to make Insituform whole and an award of prejudgment interest should be made for every year since the infringement began without regard to the unusual length of this lawsuit as Defendants have the use of Insituform's money even during that period of delay.

In the instant case, this Court finds that the most appropriate rate to be used to calculate prejudgment interest is the rate specified by Texas law. Under Texas law, prejudgment interest should be calculated according to section 304.003 of the Finance Code which pro-

vides that the interest rate should be 10 percent if, as in the instant case, the auction rate is less than 10 percent.[20] TEX FIN. CODE ANN. § 304.003; *see also Oiness v. Walgreen Co.*, 88 F.3d 1025, 1033 (Fed. Cir. 1986) (holding that the district court did not abuse its discretion by awarding prejudgment interest at the state statutory rate rather than the rate requested by the patentee); *Kerwit Medical Products, Inc. v. N&H Instruments, Inc.* 224 USPQ 679, 691 (N.D. Tex. 1984) (finding that state statutory interest rate to be appropriate to apply to a prejudgment interest award) The Court also finds that the compounding of interest better accomplishes the overriding purpose of an award of prejudgernent interest-to make the patent owner whole by compensating him for the lost use of royalty income that he rightfully should have been paid. *See Styrker Corp. v. Intermedics Orthopedics, Inc.*, 891 F.Supp. 751, 833 (E.D.N.Y. 1995) (stating that "the prejudgment interest awarded should be compounded, because the incremental profits [the patentee] would have earned on the lost sales over the infringement period would have been invested in a manner resulting in yearly accrued growth").

Finally, prejudgment interest should be calculated from the time of the infringing activity. *Bio-Rad Laboratories, Inc. v. Nicolet Instruments Corp.*, 807 F.2d 964, 967 (Fed. Cir. 1986) ("The normal procedure under

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[20]The auction rate under section 304.003 is "quoted on a discount basis for 52-week treasury bills issued by the United States government as most recently published by the Federal Reserve Board before the date of computation". TEX FIN. CODE ANN. § 304.003. The auction rate as of the date of computation is 5.271 %.

Devex is to award prejudgment interest from the date of infringement to the date of payment, since only such award will satisfy 'Congress' overriding purpose [in section 284] of affording patent owners complete compensation'") (quoting Davies U.S. at 655, 103 S.Ct. at 2062). In this case, the infringing activity began in 1990 with respect to infringement by CAT/Inliner and in 1992 with respect to infringement by CAT/Inliner licensees.

With respect to infringement by CAT Inliner, the Court has determined that 76.6% of the damages occurred in 1990 and 23.4% of the damages related to infringing activity occurred in 1991. Although the Court is unable to use the calculation of pre-judgment interest prepared by Insituform in Plaintiff's Exhibit No. 61, Schedule 9, as it includes the calculation of interest on damages that the Court has excluded and also calculates the interest at a higher royalty rate, the Court has utilized that table solely for the purpose of determining the percentage of loss attributable to each year of infringing activity by the CAT/Inliner licensees. The total damage figure used for determining the damages based on infringement by CAT/Inliner licensees begins in 1992 (see Plaintiffs Exhibit No. 61, Schedule A-7). Accordingly, the percentage of loss attributable to each year for the reasonable royalty on jobs performed by CAT/Inliner licensees is equivalent to the percentages of those damages listed on Plaintiffs Exhibit No. 61, Schedule A-9 for each year from 1992 through 1995 (Line 4, Reasonable royalty on infringing sales) as follows: 1992 - .002 %; 1993 - .214 %; 1994 - .335 %; and 1995 - .449 %. Insituform will therefore be awarded prejudgment interest, calculated at the rate of 10% per

annum and compounded annually, in the amount of $3,381,034.81.[21]

VI. Conclusion

Accordingly, the Court awards the following in damages:

Reasonable Royalty on Gulf Coast Market jobs:	$1,214,892
Reasonable Royalty on jobs performed by CAT/Inliner licensees:	$2,344,287
Actual damages:	$3,559,169
Prejudgment Interest:	$3,381,034.81
Enhanced Damages:	$1,799,584
Attorney Fees:	$806,501.25
Grand Total Damages:	**$9,546,289.06**

The damages for which Michigan is jointly and severally liable are $778,452. Prejudgment interest on that amount only is $932,110.10.

After the conclusion of the trial, the parties filed the following motions: Motions for Judgment as a Matter of Law Because of No Standing and No Damages Proof by Defendants (Instrument No. 442); Motion for Judgment as a Matter of Law on inducement to Infringe and Willfulness Issues by Defendants (Instrument No. 443); Motion for Judgment as a Matter of Law by Inliner Americas, Inc (Instrument No. 444); Motion for Judgment on Partial Findings by Kanal Sanierung Hans

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[21] *See* Appendix 1 (Chart)

Mueller (Instrument No. 450); and Motion Under Rule 21 and 15(a) to add Insituform North America Corp, A Tennessee Corporation and, if necessary Insituform (Netherlands) BV as a party or parties by Plaintiffs (Instrument No. 452). Because the issues raised by these motions have been addressed by the Court's Findings, each of the aforementioned motions will be **DENIED** as moot. (Netherlands) BV as a party or parties by Plaintiffs (Instrument No. 452). Because the issues raised by these motions have been addressed by the Court's Findings, each of the aforementioned motions will be **DENIED** as moot.

Accordingly, Insituform's motion to amend is **GRANTED in PART** and **DENIED in PART**. (Instrument No. 500). Defendants' motion to amend is **DENIED**. (Instrument No. 506). Defendant KM's motion for additional findings is **GRANTED**. (Instrument No. 504).

The Clerk shall enter this Order and provide a copy to all parties.

SIGNED this 30th day of August, 1999.

/s/ Vanessa D. Gilmore
VANESSA D. GILMORE
UNITED STATES DISTRICT JUDGE

APPENDIX 1

PREJUDGMENT INTEREST CHART

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999 (August 30)
CAT/ Inliner Sales	930,599 (76.6%)	284,282 (33.4%)								
Licensees Sales			4,688.57 (.002)	501,677.42 (.214)	785,336.15 (.335)	1,052,584.86 (.449)				
Total Loss	930,599	284,282	4,688.57	501,677.42	785,336.15	1,052,584.86				
Prior Year Loss		1,023,658.90	1,438,734.90	1,587,765.70	2,298,387.40	3,392,095.80	4,889,148.60	5,378,063.40	5,915,869.70	6,507,456.60
Interest	93,059.90	130,794.09	144,342.34	208,944.31	308,372.35	444,468.06	488,914.86	537,806.34	591,586.70	432,745.86
TOTAL										$3,381,034.81

APPENDIX F

IN THE UNITED STATES DISTRICT COURT FOR THE SOUTHERN DISTRICT OF TEXAS HOUSTON DIVISION

INSITUFORM TECHNOLOGIES, INC., INSITUFORM (NETHERLANDS) B.V., AND INSITUFORM GULF SOUTH, INC.,
Plaintiffs,
vs.
CAT CONTRACTING, INC., MICHIGAN SEWER CONSTRUCTION COMPANY, KANAL SANIERUNG HANS MUELLER GmgH & CO. HK, AND INLINER U.S.A.
Defendants.
CIVIL ACTION NO. H-90-1690
UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
ENTERED
SEP 03, 1998
Michael N. Milby, Clerk

FINDINGS OF FACT AND CONCLUSIONS OF LAW

On the 9th day of September, 1997, the above-styled and numbered case came on for trial. Both sides appeared and announced ready for trial, and the case was tried to the Court from September 9 to September 12, 1997. At the conclusion of Plaintiffs' case in Chief, Defendants moved for judgment as a matter of law as to Plaintiffs' claims. The Court reserved ruling on Defendants' motions. The Court enters the following findings of fact and conclusions of law on the evidence presented.

1. Background

Plaintiffs Insituform (Netherlands) BV ("BV"), Insituform Technologies, Inc. ("ITI"), Insituform Gulf South ("IGS") (hereinafter collectively referred to as "Insituform") are specialists in the business of pipe rehabilitation. BV, although not licensed to do business, is the record owner of the intellectual property rights to the trenchless technologies of the Insituform Process for pipeline rehabilitation.[1] (Plaintiffs' Ex. 63) BV is wholly owned by its holding company, Insituform Licensees B.V. ("Insituform Licensees"). *Id.* Insituform Licensees, also not licensed to do business, is wholly owned by INA Acquisition Corporation ("INA") which in turn is owned by ITI, the parent company. *Id.* In addition to serving as the administrative headquarters for the Insituform organization, ITI also conducts research, performs Insitutube manufacturing and product engineering. Insituform North America Corp. ("INAC"), not a party to this suit, is wholly owned by ITI and is the sister company to INA. *Id.* INAC is the domestic licensing company for the Insituform Process in the United States. *Id.* Finally, IGS is wholly owned by Naylor Industries, Inc. ("Naylor"), a wholly owned subsidiary of ITI. *Id.* IGS is authorized to do business in Louisiana, Mississippi

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[1] Insituform's patent rights were originally held by Insituform Licensees, a subsidiary of Insituform Group Limited ("IGL") at the time of IGL's acquisition in December of 1992. The patent rights were then transferred to BV by a Sale and Purchase Agreement executed on December 7, 1992. (Plaintiffs' Ex. 63). A patent assignment dated December 3, 1992, was filed with the United States Patent and Trademark Office on December 7, 1992. Under the patent assignment, Insituform Licensees conveyed to BV "all claims for damages by reason of past infringement of said patents . . ." (Defendants' Ex. I subexhibit D).

and Texas and licensed to perform Insituform technology in designated regions throughout the United States. *Id.*

Defendants Cat Contracting, Inc. ("CAT"), Inliner U.S.A. ("Inliner"), Inliner Americas ("Americas"), Kanalsanierung Hans Mueller GmbH & Co. KG ("KM") and Michigan Sewer Construction Company ("Michigan Sewer") (hereinafter collectively referred to as "Defendants") are likewise in the business of rehabilitating and restructuring various types of pipes, including sanitary, storm sewer, water main, conduit and industrial pipe. Americas operates as the holding company for its wholly-owned operating subsidiaries, CAT and Inliner. Inliner oversees the marketing of America's trenchless procedure for pipe rehabilitation to potential licensees, municipalities and industrial customers. In addition, Inliner manufacturers pipe liners and related materials which it sells to CAT and its licensees. CAT is responsible for marketing, bidding/negotiating contracts with customers and managing its pipeline rehabilitation contracts. KM is licensee of Kanal Mueller Gruppe International ("KMG"), a German pipeline cleaning and rehabilitation company founded in 195 1. KM operates in Germany. Michigan Sewer is a Michigan corporation also in the pipe rehabilitation business.

In early 1989, after reading about KM's proprietary sewer rehabilitation technology in a trade magazine, Mr. Guilio Catallo ("Catallo"), the president of CAT, contacted KM for the purpose of obtaining a license for that technology. In March of 1989, he traveled to Europe to observe KM's process for impregnating and installing liners in underground sewer lines and to negotiate a license from KM. On March 17, 1989, Catallo signed a

letter of intent with KM to license KM's technology.[2] Although KM stated in a letter written on November 1999, that CAT was a "qualified Licensee for our KM-INLINER sewer relining process for the territories of the USA'" there, was no formal license agreement executed by the parties. (Plaintiffs, Ex. II at Ex. II). An actual license agreement, however, was later executed between KMG and Inliner, permitting CATs use of "inventions for the lining of pipelines and passageways known as 'INLINER' and the letters Patent therefore issued by the United States of America, being Patent No. 4,777,562." (Plaintiffs" Ex. 7 at p. 10). The License Agreement also stated that "The Licensee has been informed of a threat of a possible claim for infringing the INSITUFORM method." *Id.*

Catallo testified that KM told him, during his March 1989 visit, that it had been involved in a patent dispute with Insituform. Based on this information, Catallo contacted Arnold, White & Durkee ("AWD"), a Houston based law firm specializing in intellectual property rights, upon his return from Germany. Catallo asked AWD to analyze the American counterparts of the patents that Insituform had used to challenge KM's patents in Germany and to advise him whether use of KM's technology would infringe such patents. Before Catallo received AWD's opinion regarding the potential, if any, for infringement of Insituform's patents, he signed a bid on behalf of CAT Contracting and Michigan Sewer, a joint venture, to perform pipe rehabilitation services for the City of Houston, specifically, Wastewa-

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[2] KM and CAT had, at one point, contemplated entering into an license agreement-Plaintiffs produced at trial a license agreement between the parties that had never been executed.

ter Job Nos. 3907-7, 3907-12 and 3907-16 (hereinafter referred to the "Sims Bayou Contracts"). Catallo testified, though, he did not submit such bid until March 21, 1989, after his lawyer at AWD, Susan Knoll ("Knoll"), orally advised him that use of the KM technology would not, in her view, infringe Insituform's patents Nos. 4,009,063 ('063 patent) and 4,786,345 ('345 patent). Knoll did not mention Insituform patent No. 4,366,012 ('012 patent), which covers the pipe rehabilitation process at issue in this case, since there was no European patent comparable to the '012 at that time. Catallo subsequently received a detailed written report, providing the analytical basis for Knoll's earlier oral opinion of noninfringement. The report contained an analysis regarding the potential for infringement of only the '063 and '211 patents.

During the bidding process for the Sims Bayou Contracts, Catallo was sent a letter dated April 7, 1989, by Insituform's attorney, Mr. Harold James ("James"), notifying CAT and Michigan Sewer that if they practiced the process being utilized by KM, they would infringe the '063 patent and the `345 patent. The letter did not address the '012 patent nor was Mr. Catallo, notified of the '012 patent until this lawsuit was filed. Catallo and Knoll testified that it was due to this lack of notice regarding the existence of the '012 that a written opinion concerning such patent was not prepared by AWD. However, neither Catallo nor AWD had previously made any attempt on their own to determine what other patents Insituform owned in the United- States and whether the use of the KM process in the United States would infringe these patents, if any did in fact exist.

CAT/Michigan Sewer submitted the lowest bid for the Sims-Bayou Contracts and was, as a result, awarded the jobs. The Sims Bayou Contracts No. 3907-7, 3907-12 and 3907-16 were executed between the City of Houston and CAT/Michigan Sewer on 8/7/89, 10/23/89 and 11/13/89, respectively. KM assisted CAT/Michigan Sewer in the performance of these jobs by demonstrating to CAT/Michigan Sewer in March of 1989 , the two cup German Inliner vacuum impregnation technique. Catallo had earlier observed and by training CAT/Michigan Sewer's personnel to properly use such technique. 'From this method of impregnation, the Multiple Cup Process ("Process 1"), which utilizes a plurality of vacuum cups to draw a vacuum from a corresponding number of slits in a liner that had been inserted into the pipe to be repaired, was developed by CAT and Inliner. Process I was used to complete the Sims-Bayou Contracts.

On February 2, 1990, Insituform filed an original complaint against Defendants in the Eastern District of Michigan, alleging infringement not only of the '063 and '345 patents, but also of the '012 patent. In May of 1990, the case was transferred to the Southern District of Texas. Insituform filed an amended complaint in this court, realleging infringement of the '063 and '012 patents but dropping charges relating to the '345 patent. Defendants filed an answer, asserting, among other things, that the patents had not been infringed.

In June 1991, after a two-week trial conducted by Judge Lynn Hughes, a jury returned a verdict that included the finding that both patents were infringed. Defendants filed motions for new trial and judgement notwithstanding the verdict. On August 28, 1991, Judge Hughes partially granted Defendants' motions, ordering judgment notwithstanding the verdict on the issue

of literal infringement of the '063 and the '012 patents and granting a new trial on the issue of infringement under the doctrine of equivalents. The matter of damages had previously been bifurcated from the issue of infringement by order of the Court dated March 5, 1991.

Following the conclusion of the first trial, Inliner began using a second process for pipe rehabilitation, Process 2. Process 2 entails the use of tubes or "needles", instead of vacuum cups as in Process 1, which are positioned along the liner to create a continuous vacuum. Catallo testified that the shift from cups to needles was based in part on the fact that needles did not fall, as did the cups, from the outer felt layer of the liner and in part on Knoll's belief that infringement of the '012 was less likely if needles were used. Catallo also testified that CAT/Inliner taught only Process 2 to their licensees, the first of whom was authorized to use the Inliner technology in 1992. On September 30, 1995, this Court found that both Process I and 2 were infringing under the doctrine of equivalents. Defendants shortly thereafter modified Process 2 to a third process, Process 3, which Insituform stipulates is not infringing.

Defendants appealed the Court's final decision of infringement. On November 6, 1996, the Federal Circuit affirmed the Court's holding in part and vacated in part due to this Court's use of an incorrect claim construction in reaching its decision that Process I and Process 2 were infringing under the doctrine of equivalents. The case was thereafter remanded for new findings on this issue. Upon remand, the Court issued revised findings on December 31, 1996 again concluding Process 1 and 2 were infringing under the doctrine of equivalents.

The damages portion of this case was tried on September 9, 1997. Insituform claims that IGS, the exclusive licensee of Insituform: technology in the United States, is entitled to recover its lost profits, which amount to $10.5 million, on those jobs for which IGS and CAT/Inliner directly competed but which were ultimately awarded to CAT/Inliner. ITI contends that it is entitled to recover its lost profits, in the amount of $7.7 million, on the liners it would have sold to IGS had IGS been awarded the jobs performed by CAT/Inliner. With respect to infringement by CAT/Inliner licensees, Insituform maintains it should be awarded no less than a reasonable royalty, in accordance with 35 U.S.C. § 284, calculated at a royalty rate of 20.5 % for a total of $6.2 million because CAT/Inliner actively induced infringement by their licensees. Finally, Insituform asserts that it is entitled to enhanced damages and attorneys' fees for Defendants' willful infringement and approximately $6.8 million in pre-judgment interest.

In contrast, Defendant argue that neither IGS nor ITI have, standing to sue since neither entity is the legal owner or exclusive licensee of the patent in issue, thereby precluding their entitlement to monetary damages under the Patent Act. Defendants next argue that the true owner of the patent, BV, has not been joined as a party to this suit and as a result, there is no evidence in the record to support any award of damages in its behalf. Defendants also claim that adding BV as a party plaintiff at this late date would be unduly prejudicial to Defendants' case. At a minimum, Defendants claim, if BV is joined as a party, it is only entitled to reasonable royalty damages at a rate of no more than .4%. If both IGS and ITI have standing to sue, Defendants contend that the measure of damages should be a reasonable

royalty and not lost profits since neither IGS or ITI has met their burden of proof with regard to lost profit damages. KM, however, denies liability for damages because, it contends, there is no proof that it induced infringement. Absent such proof, KM argues, it cannot be held jointly and severely liable for any damages Insituform sustained as a result of the proven infringement. Inliner and CAT also maintain that they cannot be held liable for inducing infringement and that any damages Insituform has requested as a result of CAT/Inliner licensees' alleged infringement are therefore unwarranted. In addition, Inliner and CAT contend that Insituform has failed to adduce proof that their infringement was willful, thereby negating Insituform's claim for enhanced damages and attorneys' fees and that any pre-judgement interest awarded should be computed as simple interest and not compounded, with the period during which Insituform did nothing to prosecute this action-July of 1994 through June of 1994-excluded from the computation

II. Standing

A. IGS' Standing to Sue

Insituform first contends that IGS has standing to sue in this case because it is the exclusive licensee of Insituform technology. In order to be entitled to money damages for patent infringement, the plaintiff must generally show that it held legal title to the patent at the time the infringing acts occurred. *Rite-Hite Corp. v. Kelly Co., Inc.*, 56 F.3d 1538, 1551 (Fed. Cir, 1995). Legal title is conveyed only thru transfer of the entire patent, an undivided portion or share of the entire patent, or by conveyance of all rights under the patent in a specific geographical region of the United States. *Id.* In other words, the monopoly granted by a patent:

> is one entire thing, and cannot be divided into parts, except as authorized by law. The patentee or his assigns may, by instrument in writing, assign, grant, and convey either (1) the whole patent, comprising the exclusive right to make, use, and vend the invention throughout the United States; or (2) an undivided part or share of that exclusive right; or (3) the exclusive right under the patent within and throughout a specified part of the United States.

Waterman v. Mackenzie, 138 U.S. 252,255, 11 S.Ct. 334,335 (1891). A transfer of either of these three kinds of interests "is an assignment, properly speaking, and vests in the assignee a title in so much of the patent itself, with a right to sue for infringers," *Waterman*, 138 U.S. at 255, 11 S.Ct. at 335. "Any assignment or transfer, short of one of these, is a mere license, giving the licensee no title in the patent, and nor right to sue at law in his own name," *Id.* Therefore, a party who has "received, not only the right to practice the invention within the given territory, but also the patentee's express or implied promise that others shall be excluded from practicing the invention within that territory as well" is an exclusive licensee, entitled to bring suit for infringement as a co-plaintiff with the patentee. *Rite Hite*, 56 F.3d 1539. 1552 (Fed. Cir. 1995).

In addressing the right of an exclusive licensee to bring suit for infringement, the court in *Philadelphia - Brief Case Co. v. Specialty Leather Product Co.*, stated that:

> [s]ince the creation of such rights in the so-called exclusive licensee, impliedly if not expressly, prevents the proprietary owner of the patent from

> creating further rights therein in unknown third parties, this so called exclusive licensee, while only a licensee, comes so close to having truly proprietary interests in the patent, that the courts have held that he is equitably entitled to sue on the patent, provided he joins the true proprietor of the patent in such suit, either as a willing or unwilling plaintiff or defendant.

145 F.Supp. 425, 428 (D. N.J. 1956). Thus, "if a party has not received a promise of exclusivity under the patent, it cannot have co-plaintiff standing in an infringement action." *Ricoh Co. Ltd v. Nashua Corp.*, 947 F.Supp. 21, 24 (D. N.H. 1996).

In support of its contention that it is an exclusive licensee, IGS argues that the "contract between ITI and IGS is *expressly* a patent license, and it gave IGS the exclusive right to practice the patented invention in its territory. That is what the contract explicitly says-'exclusive license'". (Plaintiff's Consolidated Pretrial Memorandum at 3 1) (emphasis in original). However, "[w]hether a transfer of a particular right or interest under a patent is an assignment or a license does not depend upon the name by which it calls itself, but upon the legal effect of its provisions." *Waterman*, 138 U.S. at 256, 11 S.Ct. at 335. Simply using the language "exclusive license" in the body of the agreement does not equate to a "promise of exclusivity" absent the conveyance of rights amounting to proprietary interests in the patent.

IGS further asserts that the license agreement clearly conveys to IGS the exclusive right to practice the patented technology in a particular geographical region, Specifically, IGS argues that:

> [i]t enjoyed an exclusive position in its defined territory-it was completely exclusive with respect to the entire world other than ITI licensees in other territories, and with respect to those other licensees it enjoyed a very favorable competitive position-another 1TI licensee, if it wanted to enter IGS's territory, would have to pay a penalty of 12% of the contract price, which constituted a quite substantial cushion in the competitive bidding which was involved in this industry. For IGS to lose a bid to an invading ITI license it would have to grossly overbid, so that as a matter of practicality it was exclusive except when it felt that it did not need to be exclusive and hence would take a chance on bidding high.

(Plaintiff's Consolidated Pretrial Memorandum at 35-36).

Contrary to IGS's contentions, however, the license agreement does not transfer to IGS an exclusive interest in the patented technology. While the agreement does provide for the assessment of a penalty in the event another licensee invaded IGS's territory, it does not grant IGS the right to exclude others from its geographic area of operation. Rather, the agreement states that

> [INAC (the licensing company for the Insituform process and sister company to BV, the record owner of Insituform's patents)], in its sole discretion, has the right itself to operate businesses under [the "Insituform" trademark], and to grant other licenses in, to and under such Proprietary Marks on any terms and conditions North America deems fit; provided, however that INAC may so operate or

> grant other licenses subject to the limitations of this agreement within [IGS's] exclusive territory, but solely for use of the Insituform Process in lining tunnels, pipelines, and other passageways used to carry natural or manufactured fuel gases or other hazardous gases.

(Plaintiff's Ex. 18A).

In addition, the agreement states that "INAC retains the right to grant exclusive Licenses to other Operators in other defined Territories" and that "[IGS] acknowledges that MAC cannot prevent other operators from exploiting the subject matter in [IGS's] exclusive territory." *Id.* Moreover, in the event third parties improperly used Insituform technology, IGS was precluded under the terms of the agreement from bringing suit for such conduct on its own and without prior approval from INAC. The agreement also fails to make provision for the distribution of any recovery obtained through the prosecution of an infringement action. Instead, the agreement provides in relevant part that:

> INAC does hereby agree, at its expense, to use its best efforts to defend the Patent Rights by such means as in its sole discretion may determine appropriate, including but not limited to, patent infringement suits. INAC reserves, however, the exclusive right to determine whether a patent infringement has occurred or whether litigation or other action is appropriate or feasible.

Id. Finally, the agreement states that in the event INAC undertook the defense or prosecution of any litigation, "IGS agree[d] to execute any and all documents and do such acts and things which may, in the opinion of counsel for INAC, be necessary to carry out such defense

or prosecution, either in the name of INAC or in the name of [IGS], as INAC shall elect." *Id.* IGS's cooperation in bringing this suit, however, is not sufficient, in and of itself, to confer upon IGS standing to sue. *Rite-Hite*, 56 F.3d. at 1553 ("While the patentee and the [licensees] have cooperated in this litigation, that fact alone does not establish their right to sue."), Thus, absent language that transfers to IGS a proprietary interest in the patented technology or authorizes IGS to sue infringers, IGS lacks standing to bring a patent infringement action, requiring its dismissal as a party to this action.

B. ITI's standing to sue

Insituform next contends that ITI has standing to sue for damages resulting from Defendants' infringement because ITI, as sole owner of INAC and parent of BV "should be considered as the exclusive licensee in the United States," (Instrument No. 452 at. 12). Insituform argues that such a result is proper because ITI "has wholly owned INAC continuously from its inception, and ... ITI has provide[d] technical assistance to its licensees and m[ade] liners and [sold] them to its licensees." *Id.* at 12. Moreover, Insituform argues that:

> ITI, when it acts as the exclusive company in this country to manufacture liners and sell them to licensees, is also exercising rights which the license from the titular patent owner grants. Hence in reality both ITI and INAC are together exercising exclusive license fights, but it is only ITI which is really in business, which has any dealing with the outside world....

Id. at 12-13.

It is well established that "an equitable title to a patent accrues to a corporation in patents owned by its constituent corporation," *Pipe Liners, Inc. v. American Pipe & Plastics, Inc.*, 893 F.Supp. 704, 706 (S.D. Tex, 1995). Consequently, a parent corporation would have standing in an infringement action to seek equitable remedies. *Id.* However, there is no authority, either provided by Insituform or that this Court could find on its own, for the proposition that a parent corporation, merely by virtue of its equitable title, i.e., its ownership in a subsidiary holding legal title to a patent, is afforded a legal remedy for infringement of its affiliate's patent. *See Site Microsurgical Systems, Inc. v. Cooper Co.*, 797 F.Supp, 333, 338 (D. Del. 1992) ("The Court is not convinced, and the plaintiff offers no authority, that a parent corporation effectively has the patent rights of owners, assignees, and licensees by virtue of its ownership of a subsidiary holding a patent."). Nor is there any decision expressly stating that a parent's involvement with or control of a subsidiary's actions taken in connection with the patented product is sufficient, by itself, to justify recognizing the parent as the real party in interest and allowing it a legal remedy for patent infringement.

As stated above, the general rule governing standing in patent cases "is that one seeking to recover money damages for infringement of a United States patent (an action 'at law') must have held the legal title to the patent during the time of the infringement." *Arachnid, Inc. V. Merit Industries, Inc.*, 939F.2d 1574, 1579 (Fed. Cir, 1991); 35 U.S.C. §§ 101, 102, 151. "'These owners are the patentee, his assignee, his grantee, or his personal representative, and none but these are able to maintain an action for infringement in a court of law.'"

Id. (quoting *Crown Die & Tool Co. v. Nye Tool & Machine Works*, 261 U.S. 24, 43 S.Ct. 254 (1923)). In addition, "an exclusive licensee generally has standing to sue for infringement for the unauthorized use within the area of exclusivity." *Site*, 797 F.Supp. at 337.

Exceptions to this rule authorizing the patentee or its exclusive licensee standing, however, have only been made to confer the right to sue to: (1) an assignee in a suit for infringements occurring prior to the time title was transferred to him when the assignment of the patent was coupled with an assignment of a right of action for past infringement; *Site*, 797 F.Supp. at 1579 n.7, and (2) a sole licensee without an exclusive license when the sole licensee has been shown to be directly damaged by an infringer in a two supplier market and when there is a clearly defined nexus between the sole licensee and the patentee. *Kalman v. Beryln Corp.*, 914 F.2d 1473, 1482 (Fed. Cir. 1990). Such exceptions are recognized "not only [to] give effect to principles of equity but also [to] the Congressional mandate that, in patent actions, '[u]pon finding for the claimant the court shall award the claimant damages adequate to compensate the infringement....'" *Kalman*, 914 F.2d at 1482 (quoting 35 U.S.C. § 284 (1982)).

Insituform asserts that the exception recognized in *Kalman* has been used to confer standing in the following situations to: (1) an entity that was actively involved in the manufacture and distribution of the patented technology under the direction and control of the exclusive licensee, *CVI/Beta Ventures*, Inc. v. Tura LP, Et AL, 905 F.Supp, 1171, 1199 (E.D. N.Y. 1995), and (2) an entity that had not been given exclusivity under the patent, yet, for all practical purposes, operated as the exclusive licensee, see *Ricoh Company, Ltd. v. Nashua*

Corp., 947 F. Supp. 21, 24 (D. N. H. 1996). Insituform argues that based on the result reached by the courts in these cases, this Court should grant ITI, the entity which is essentially performing the duties of an the exclusive licensee by manufacturing and marketing liners and providing technical assistance to Insituform licensees, standing to sue. The Court, however, does not agree.

In *CVI/Beta Ventures, Ina v. Tura LP, Et Al*, the court granted standing to two corporations, Rothandberg, Inc. ("Rothandberg") and Marcolin U.S.A., Inc., ("Marcolin"), who were affiliated and controlled by the exclusive licensee, Marchon Eyewear, Inc., ("Marchon"). Although both companies functioned as Marchon's manufacturing arm, neither possessed a legal interest in the disputed patent. *CVI/Beta Ventures*, 905 F.Supp. at 1198. In determining that Marcolin and Rothandberg could in fact maintain an action for infringement, the court focused on the relationship between the entities, stating that *Kalman* had intended standing to be granted when there was a "close nexus between the patentee and the licensee with respect to the marketing of the patented item," *Id.*[3] In reaching this conclusion, the court

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[3] Notably, the court in *CVI/Beta Ventures* was not deciding the standing issue de novo but was instead evaluating the propriety of a previous ruling by a magistrate judge. The magistrate's decision to grant Marcolin and Rothandberg standing to sue had subsequently been adopted by the district court judge to whom the case had been assigned at the time. After the trial and a jury verdict in Rothandberg's and Marcoln's favor, the defendant requested the court to revisit this issue. The court was therefore constrained in its review by the law of the case doctrine which limits reconsideration of an earlier court order "only upon a showing that the applicable law has changed, that pertinent new evidence has been developed, or that the prior order was clearly erroneous or mani-

Footnote continued on next page.

attempted to distinguish its holding from the decision reached in *Site Microsurgical System Inc. v. Cooper Co.*

The district court in *Site* found that the *Kalman* exception existed only in cases where there was "(1) direct damage to the sole licensee by an infringer in a two supplier market, and (2) a close nexus between the sole licensee and the patentee," 797 F.Supp. at 338. The patentee in this case, *Site* Microsurgical Systems, Inc, had filed a motion to join its parent corporation, Iolab Corporation as a plaintiff. Iolab argued that joinder was proper because "'it [was] Iolab who effectively controll[ed] the patents and who ultimately suffers the loss from the [defendant's] infringement.'" *Site*, 797 F.Supp. at 338 (quoting excerpts from the plaintiffs motion). Iolab further argued that it was "the 'real party in interest' and that it [had] standing under the test in *Kalman*." *Id.* at 338. In denying Iolab's request, the court stated:

> Iolab possesses no license of any kind and it is not marketing the patented technology on behalf of the patentee. Iolab's only connection to the patented technology is its attenuated relationship through corporate ownership... (Moreover), Iolab's argument fails to offer authority to support the proposition that a mere close nexus between a patentee and a

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Footnote 3 continued.

festly unjust." *CVI/Beta Ventures*, 905 F.Supp. at 1197. In denying the defendant's request for reconsideration, the court found that "[p]articularly in light of *Kalman*, the decisions rendered [previously] were not clearly erroneous .... [and] there is no reason to allow defendants to relitigate the question of standing. . . ." *Id.* at 1198. Thus, under this more deferential standard of review, the CVI/Beta Venture court's holding and the reasoning it employed to reach such a result is, arguably, of limited value.

> third-party lacking any patent rights is sufficient under the statutory scheme. The Court is not persuaded that the patent laws are designed to compensate every party "related" to the patented technology or every party who "anticipates" the sale of the patented products.

Id.

Much like Iolab in *Site*, *CVI/Beta Ventures* mistakenly relied on *Kalman* for the proposition that a corporate connection alone is sufficient to extend standing to entities otherwise not entitled to sue for patent infringement. The *CVI/Beta Ventures* court reached its decision to grant standing without either discussing the first element of the *Kalman* exception or citing authority stating that such an omission was permissible. *Kalman* specifically held that standing would be permitted only when both "the sole licensee. . has been shown to be directly damaged by an infringer in a two supplier market, and ... the nexus between the sole licensee and the patentee is so clearly defined." *Kalman*, 914 F.2d at 1482. By overlooking this first requirement, the *CVI/Beta Ventures* decision clearly exceeds the holding in *Kalman* and directly contradicts the exclusivity concept of patent law. Moreover, the decision advances, as alluded to by the court in *Site*, a rule of law which would permit "every party 'related' to the patented technology" a legal remedy for infringement. *Site*, 797 F. Supp. at 338. Unlike the court in *CVI/Beta Ventures*, this Court declines to extend *Kalman* beyond its holding to permit an entity like ITI, which is not operating as the sole licensee in a two supplier market, standing simply

because of the corporate interrelationship between it and the patentee.[4]

Insituform also relies on *Richoh Co. Lid v. Nashua Corp.*, as support for its contention that standing may be granted to a non patent-owner under certain circumstances, particularly those present in the instant case. 947 F.Supp. 21, 23 (D. N. H. 1996). In *Richoh*, the court held that a wholly owned subsidiary of the patentee would have standing if it was first determined upon review of the surrounding circumstances that an implied exclusive license existed between the parties. *Richoh*, 947 F.Supp. at 23, The court considered, as a key factor in making this determination, the relationship between the entities and the degree to which the subsidiary was controlled by the patentee. *Richoh*, 947 F.Supp. at 23. However, the court also noted that:

> [t]he exclusive character of the manufacturing license held by RE [the subsidiary] is demonstrated not only by the reality that Richoh Ltd. [the parent corporation] effectively controls the manufacture of all products subject to the '063 Patent, but also by the fact that REI was and still is the sole United States manufacturer of Richoh copier supply products. . . . In addition, Richoh Ltd. has never granted any party other than REI a commercial license under the '063 Patent.

Ricoh, 947 F.Supp. at 24. Such is not the case here. ITI is not the sole licensee of Insituform technology nor is there evidence indicating that Insituform BV, the patent

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[4] The Court also finds that IGS should not be conferred standing under the *Kalman* exception because the proof adduced at trial does not show that IGS was operating as the sole licensee in a two supplier market.

holder, intended ITI to operate as its exclusive licensee. Absent legal ownership or a promise of exclusivity under the patent, ITI has not had any of its legal rights violated by Defendants' infringement. At most, ITI has suffered only financial loss. *See Lindemann Maschinenfabrik v. American Hoist & Derrick Co.*, 895 F.2d 1403, 1406 (Fed Cir. 1990) ("In patent law, the fact of infringement establishes the fact of damage because the patentee's right to exclude has been violated."). However, "economic injury alone does not provide standing to sue under the patent statute." *Ortho Pharmaceutical Corp. v. Genetics Institute*, 52 F.3d 1026, 1031 (Fed. Cir, 1995). Therefore, based on the foregoing, the Court finds that ITI lacks standing to sue for monetary damages.

III. Joinder

Insituform now moves under Rules 15(a) and 21 to add INAC and if necessary, Insituform (Netherlands) B.V. as a party plaintiffs. Rule 15(a) provides that "a party may amend the party's pleading only by leave of court or by written consent of the adverse party; and leave shall be freely given when justice so requires." Fed. R. Civ. P. 15(a). Rule 21 states that "parties may be dropped or added by order of the court on motion of any party or of its own initiative at any stage of the action and on such terms as are just." Fed. R. Civ. P. 21.

The decision to grant or deny a motion for leave to amend lies within the sound discretion of the trial court. *Benitez-Allende v. Alcan Aluminio do Brasil, S.A.*, 857 F.2d 26, 36 (1st Cir. 1988). However, leave should be granted "[i]n the absence of any apparent or declared reason-such as undue delay, bad faith or dilatory motive on the part of the movant, repeated failure to cure

deficiencies by amendments previously allowed, undue prejudice to the opposing party by virtue of allowance of the amendment, [or] futility of amendment. *Foman v. Davis*, 371 U.S. 178, 182, 83 S.Ct. 227, 230 (1962). Moreover, "'outright refusal to grant the leave without any justifying reason appearing for the denial is not an exercise of discretion; it is merely abuse of that discretion and inconsistent with the spirit of the Federal Rules.'" *Kalman*, 914 F.2d at 1480 (quoting *Froman*, 371 U.S. at 182, 83 S.Ct. at 230). This liberality in granting leave to amend is not completely unrestricted; rather, it remains "subject to the qualification that amendment of the complaint does not cause the opposing party undue prejudice." *DCD Programs, Ltd. v. Leighton*, 833 F.2d 183, 186 (9th Cir. 1987). The burden is on the party opposing the amendment to show prejudice. *Beeck v. Aquaslide 'N' Dive Corp.*, 562 F.2d 537, 540 (8th Cir. 1977).

Defendants argue that they would be prejudiced if INAC is allowed to join this suit because they were unaware of the existence of INAC until the eve of trial and because

> there is no competent damages proof for either the patentee or the exclusive licensee. It is clear from the damages presentation that Insituform wants lost profits. Neither Insituform Netherlands BV nor INAC can meet this standard. The requested relief: (a) join these necessary parties, (b) ignore the fact that they cannot possibly meet the threshold requirements for lost profits and have proven no monetary damages under any theory, but (c) award lost profits for jobs and tubes anyway.

(Instrument No. 453 at 2).

Insituform, on the other hand, maintains that "[t]here is no prejudice where, as in the present case, the motion does not seek to add parties that are "new", i.e., strangers to the case, but only to add parties whose rights and interests have been at issue in the case all along and about whom there has already been full discovery with respect to the issues in dispute." (Instrument No. 452 at 17). Since INAC is neither the legal patent holder nor an exclusive licensee, it would not have standing to sue even if it were joined as a party. Accordingly, the Court will deny Insituform's motion to join INAC as a party.

With regard to B.V., Defendants argue that "Insituform Netherlands BV is named in the caption, and it unquestionably has standing. However, the undisputed evidence demonstrates that it was erroneously named via an Order, prepared by plaintiff's counsel, signed, by this Court in November 1994 on the ground that it was nothing more than a 'name change'." (Defendants' Motion for Judgment as a Matter of Law Because of No Standing and No Damages Proof, Instrument No. 442 at 3-4). The Court does not agree and finds that BV was made a party to this suit by order of this Court on November 30, 1994. (Instrument No. 185). In addition, the Court finds that the rights of the legal patent owner have been at issue since the inception of this case and that Insituform Netherlands BV has presented evidence of recoverable monetary damages that Defendants have been able to rebut at trial. Therefore, Defendants would not be prejudiced if BV is recognized as a party plaintiff in this suit.

IV. Damages

Plaintiffs divided their damages proof into two distinct categories: damages owed by CAT/Inliner and Michigan Sewer for direct infringement in the Gulf Coast Market and damages owed by CAT/Inliner and KM for actively inducing infringement by CAT/Inliner licensees.

A. Gulf Coast Market

The Patent Act provides that "[u]pon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement but in no event less than a reasonable royalty for the use made of the invention by the infringer." 35 U.S.C. § 284. The purpose of section 284 is to restore the patent owner to the financial position "he would have occupied but for the infringement." 7 CHISUM ON PATENTS, § 20.03 (1997). Damages under section 294 may include "lost profits due to diverted sales, price erosion, and increased expenditures caused by infringement." *Minco, Inc. v. Combustion Engineering, Inc.*, 95 F.3d 1109, 1118 (Fed. Cir. 1996). However, lost profits cannot be awarded unless the patent holder can "show that the infringer actually caused the economic harm for which the patentee seeks compensation." *Id.* In other words the patentee must produce evidence of a "'reasonable probability that [the patent holder] would have made the asserted profits absent infringement.'" *Id.* (quoting *King Instruments Corp. v. Perego.* 65 F.3d 941, 952 (Fed, Cir. 1995)). "When actual damages, e.g. lost profits, cannot be proved, the patent owner is entitled to a reasonable royalty." *Panduit Corp. v. Stahlin Bros. Fibre Works, Inc.*, 575 F.2d 1152, 1153 (6th Cir. 1978). Since BV is neither in the business of marketing nor performing the patented

technology and since there is no evidence in the record of profits BV would have made in the absence of infringement, the most appropriate measure of recovery in the instant case is a reasonable royalty. *See Minco*, 95 F.3d at 1119 (holding that although a "patent owner may not operate in the specific geographical area covered by the infringer or may not have had the manufacturing or marketing capacity to make the infringer's sales . . . . the patentee would still be entitled to a reasonable royalty on each of those sales"); *Hanson v. Alpine Valley Ski Area*, 718 F.2d 1075, 1078 (Fed Cir. 1983) ("if actual damages cannot be ascertained, then a reasonable royalty must be determined."). All recoverable damages will be awarded to BV and Insituform's corporate structure and the distribution of any monies ultimately awarded BV is not relevant to the Court's damage analysis. A reasonable royalty is an amount "'which a person, desiring to manufacture and sell a patented article, as a business proposition, would be willing to pay as a royalty and yet be able to make and sell the patented article, in the market, for a reasonable profit.'" *Panduit*, 575 F.2d at 1157-58 (quoting *Goodyear Tire and Rubber Co. v. Overman Cushion Tire Co.*, 95 F.2d 978, 984 (6th Cir. 1937)). "The royalty may be based upon an established royalty, if there is one, or if not, upon the supposed result of hypothetical negotiations between the plaintiff and defendant."[5] *Rite-Hite*

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[5] Although hypothetical negotiations presumes willing participants, which would not be the case here where Insituform and the Defendant are direct competitors, such concept is employed by the courts only "as a means of arriving at reasonable compensation and its validity does not depend on the actual willingness of the parties to the lawsuit to engage in such negotiations; there is, of course, no actual willingness on either side." *Hanson v. Alpine Valley Ski Area, Inc.*, 718 F.2d 1075, 1081 (Fed. Cir. 1983). Courts

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Corp. v. Kelly Co., Inc., 56 F.3d 1538, 1554 (Fed. Cir. 1995). In predicting the outcome of such negotiations, the court must "envision the terms of a licensing agreement reached as a result of a supposed meeting between the patentee and the infringer at the time infringement began." *Id.* The following factors are routinely considered in establishing a reasonable royalty under these circumstances:

> 1. The royalties received by the patentee for the licensing of the patent in suit, proving or tending to prove an established royalty.
>
> 2. The rates paid by the licensee for the use of other patents comparable to the patent in the suit.
>
> 3. The nature and scope of the license, as exclusive or nonexclusive; or as restricted or non-restricted in terms of territory or with respect to whom the manufactured product may be sold.
>
> 4. The licensor's established policy and marketing program to maintain his patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve that monopoly.
>
> 5. The commercial relationship between the licensor and licensee, such as, whether they are competitors in the same territory in the same line of business; or whether they are inventor and promotor.

Footnote 5 continued.

have, however, "recognized the need to distinguish between royalties payable to infringers and non-infringers." *Fromson v. Western Litho Plate & Supply Co.*, 853 F.2d 1568, 1575 n. 11 (Fed. Cir. 1988).

6. The effect of selling the patented speciality in promoting sales of other products of the licensee; the existing value of the invention to the licensor as a generator of sales of his non-patented items; and the extent of such derivative or convoyed sales.

7. The duration of the patent and the term of the license.

8. The established profitability of the product made under the patent; its commercial success; and its current popularity;

9. The utility and advantages of the patent property over the old modes or devices, if any, that has been used for working out similar results.

10. The nature of the patented invention; the character of commercial embodiment of it as owned and produced by the licensor; and the benefits to those who have used the invention.

11. The extent to which the infringer has made use of the invention; and any evidence probative of the value of that use.

12. The portion of the profit or of the selling price that may be customary in the particular business or in comparable businesses to allow for the use of the invention or analogous inventions.

13. The portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, or significant feature, or improvements added by the infringer.

14. The opinion testimony of qualified experts.

> 15. The amount that a licensor (such as the patentee) and a license (such as the infringer) would have agreed upon (at the time the infringement began) if both had been reasonably and voluntarily trying to reach an agreement; that is, the amount which a prudent licensee-who desired, as a business proposition, to obtain a license to manufacture and sell a particular article embodying the patented invention-would have been willing to pay as a royalty and yet be able to make a reasonable profit and which amount would have been acceptable by a prudent patentee who was willing to grant a license.

Georgia-Pacific Corp. v. United States Plywood Corp., 318 F.Supp. 116, 1120 (S.D.N.Y. 1970). The assessment and computation of damages under 35 U.S. C. § 284 is a matter within the sound discretion of the district court. *Fromson*, 853 F.2d at 1576.

Insituform maintains that "it would have been reasonable for ITI, ... to have agreed, in hypothetical negotiations with [CAT] . . . for a royalty figure of 20.5 %." (Plaintiffs' Revised Proposed Findings of fact and Conclusions of Law, Instrument No. at 11). This figure was computed by adding one-half of the 8% royalty Insituform would have received from an Insituform licensee plus the 9% defacto royalty from ITI's sale of liners to Insituform, licensees) to the 12% penalty ("Crossover") Insituform would have been required to pay under the terms of the license agreement to the licensee whose

territory Defendants would have invaded if they were authorized Insituform licensees.[6]

Defendants, on the other hand, argue that "the ready availability of a non-infringing, substitute method for impregnating the resin would favor a low royalty rate." Defendants' Trial Brief, Instrument No. at 11). As further support for their claim a low royalty rate should be used, Defendants produced evidence which Defendants claim indicates that Insituform itself did not highly value the '012 patent. Defendants assert that

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[6] Under the Insituform License Agreement, the licensee was required to pay as a royalty "8% of the gross contract price of all contracts performed by [the licensee] utilizing the Subject Matter" defined as:

> all methods, apparatus and materials used in the lining of sewers, tunnels, pipelines, and other passageways (excepting those used to carry aronatice hydrocarbons in a gaseous state) by impregnating an absorbent layer with a synthetic resin, and retaining such layer in place in such passageway while the layer cures or is cured, and including all matters relating to the preparation, installation and completion of said lining." (Plaintiffs' Ex. 18A).

The agreement also provides that the licensee was "granted exclusive licenses for the exploitation of the Insituform process in certain defined territories" and that should a licensee:

> seek to exploit the Subject Matter outside of its exclusive Territory and in an area where an exclusive license has already been granted, [licensee] shall make a crossover payment of 12% of the gross contract price of all installations utilizing the Subject Matter in such areas in addition to the normal royalty payable to INAC . . . Such crossover payment shall be paid by [Licensee] to INAC who shall in turn credit such crossover payment to the licensee in whose territory the installation was performed.

Id.

Insituform licensees payed the same royalty rate-8%- both before and after the issuance of the '012 patent, which, according to Defendants, means that Insituform licensees essentially "received the right to practice the '012 method at no additional charge." (Defendants' Amended Requested findings of Fact and Conclusions of Law, Instrument No. at 16). Defendants further argue that approximately 7/8 of the 8% royalty rate paid by Insituform licenses was to compensate Insituform for "trademark rights, marketing, advertising and know-how, and the 'inversion' technology". *Id.* This left, in Defendants' opinion, only 1% to be apportioned among a variety of other patents licensed to [Insituform] licensees." *Id.* Moreover, Defendants claim that a higher rate would be unreasonable in light of the fact that 'CAT's consolidated margin on CIPP (cured in place pipe) over the five years in issue was 9.72%". *Id.* Defendants contend that the "notion that a party with a 9.72% margin would pay 20.5% of its gross revenues as a royalty. . . is palpably absurd." *Id.*

At trial, Phillip Farley ("Farley") of IGS testified that of the 8% royalty paid by Insituform licensees, 4% is attributable to the use of the Insituform name and the national advertising provided by Insituform.[7] The remaining 4%, Farley stated, was allocated between the

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[7] The 8% royalty rate under the terms of Insituform License Agreements was computed based on the "gross contract price of all contracts. . . ." (Plaintiffs' Ex. 18A). The gross contract price included "the cost of all raw materials necessary to complete the installation of the Subject Matter" and "the value of any actual, preparatory and/or finishing work performed by any subcontractor or independent contractor. . . when such actual, preparatory and/or finishing work is performed as a part of and/or adjunct to the installation and use of the Subject Matter. " *Id.*

technical and engineering support provided by Insituform and the patented technology. Farley also testified that other Insituform employees apportioned the royalty rate in a different manner than he did.

Plaintiffs' expert, Robert Goldscheider stated that because Insituform "had already granted a number of exclusive territorial licenses that included the '012 patent in the entirety of the United States" the "hypothetical negotiators needed to consider themselves subject to the 'crossover' provisions of the [INAC] sublicensees." (Plaintiffs' Ex. 15 at 6). Goldscheider also stated that Insituform licenses:

> grant rights to several patents in addition to the '012, and also include rights to know-how, copyrights, and the trademark "Insituform". There is no provision for apportionment of the royalties among these various rights, meaning that the full royalty rates are applicable if any of the licensed rights is used by a sublicensee.

Id.

In addition to considering the crossover and the fact that Insituform did not apportion its royalty amongst the various rights it provided its licensees, Goldscheider claimed that the "sale of materials from a licensor to its licensees is common in licensing arrangements" and in the instant case, ITT's profits from the sale of customized liners to its licensees, which it would realize if CAT/Inliner were licensed, should be considered "as additional *defacto* royalties." *Id.* at 8. The liners, Goldscheider testified, "together with the resin and the various steps involved in impregnation and installation, 'constitute a functional unit' so as to qualify for the entire market rule set forth in *Rite-Hite Corporation et al. v. Kelley*

Company, Inc., 56 F.3d 1538 (1995.)" *Id.* at 8. Goldscheider stated that "the amount of ITT's profits from liner sales ancillary to (or part of the 'entire market value' of) CIPP projects. . . has been calculated to be equivalent to a 9% royalty rate on total contract price." *Id.* at 13. Moreover, Goldscheider testified that contrary to Defendants' contentions, there were no available alternatives to the Insituform process at the time of infringement and that, relying upon the holding in *Panduit Corp. v. Stahlin Bros. Fibre Works*, Inc.*, 575 F.2d 1152 (6th Cir. 1987), "the subsequent appearance of a possible non-infringing alternative *after* a finding of infringement does not destroy the advantage recognition attributable to the patent during prior years". *Id.* at 7 (emphasis in original). Based on these factors, Goldscheider surmised that "the yardstick provided in [the] Rite-Hite case to the effect that an unwilling patentee would license a competitor for no less than one-half of its expected lost profits" would be applicable in this case and that a reasonable royalty in light of this standard and the aforementioned factors would be 50% of the 17% figure reflecting the 8% royalty and the 9% de facto royalty related to ITI's profits on the sale of liners added to the 12% crossover fee.[8]

Defendants' expert, Walter Bratic ("Bratic"), in his report claimed that under Insituform's License Agreement, each licensee had the right to:

> -use the technologies embodied in a number of patents (typically 6 to 15 patents, depending upon

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[8] In *Rite-Hite*, the federal Circuit hold that the district court made "no legal error" and "was not clearly erroneous" in awarding a reasonable royalty equal to approximately fifty percent of RiteHite's estimated lost profits. *Rite-Hite*, 56 F.3d at 1555.

> the date of the sub-license agreement) used in the Insituform Process, including the '012 Patent subsequent to its issue date;
>
> -use the name "Insituform"
>
> -receive training and on-going technical support relating to the Insituform Process;
>
> -benefit from future [Research and Development] efforts of Insituform

(Defendants' Ex. 19 at 6-7). Bratic also reported that "[t]he technology embodied in the '012 Patent does not create a new or separately identifiable product nor does it independently add sales value to the ultimate consumer" or "to the end product"; that "there is no customary profit specifically related to the selling of the invention; and that "Cat/Inliner could have performed its CIPP projects with no significant increase in cost without infringing the '012 patent. *Id.* at 7-9. Based on these findings, Bratic concluded that:

> It is likely that [Insituform] and Inliner would have entered into a nonexclusive sub-license agreement solely for the use of the '012 Patent for a royalty of substantially less than 8%. [Insituform's] typical sub-license agreements effectively provided the sublicenser with the technology (i.e., right to use up to 15 different patents), know-how, training and other rights and services to perform the entire Insituform Process and called for a royalty of 8% . . . . Cat/Inliner had no need for the right to use any of [Insituform's] patents other than the '012 Patent, did not require additional know-how or training and did not desire to use the Insituform name . . . .

. . .

> Therefore, one method of determining a reasonable royalty rate is to allocate the 8% royalty typically charged by [Insituform] to its sub-licensees for a comprehensive "basket" of technologies, know-how, training, etc. to the specific processes covered [and] . . . . only a small portion could be allocated to the '012 Patent.

(Defendants' Ex. 19 at 10).

Defendants have presented a creative but unpersuasive argument that the 8% royalty rate paid by Insituform licensees should be apportioned amongst the different components of the patented technology. Without presenting any evidence to support such view, Defendants argue that the '012 patent should be valued, at the most, at 1% of the royalty amount. There is no provision in Insituform's licensing agreement which would permit a licensee to select for its use only certain portions of the patented technology while excluding the remainder for a discounted royalty rate. Defendants have presented a fantastical argument that they could negotiate a different royalty rate than that assigned to all other licensees based on how much value they place on the part of the patented technology they want to use. Defendants' expert calculated damages that are numerically accurate but factually erroneous because such calculations were based on Defendants' premise that the royalty rate attributable to the '012 patent should be 1%. This rate, however, has no basis in the evidence and was merely a litigation afterthought by the Defendants offered to minimize Plaintiffs' damages.

The Court also finds that there were no available alternatives for the Insituform Process at the time of

infringement. The Everson method, which Defendants' claim to be an acceptable alternative, was not suitable for use on pipes of longer length. Not only did vacuum impregnation using the Everson method take much longer to compete than the Insituform process, it also required a larger suction compressor than was otherwise necessary. Edward Smith, an engineer with Insituform, testified that it would take at least 8 hours to complete the impregnation process using the Everson method whereas with the Insituform Process it would take just a few minutes. "A product lacking the advantages of that patented can hardly be termed a substitute 'acceptable' to the customer who wants those advantages." *Panduit*, 572 F.2d at 1162. The Court finds that the overall operational efficiency of the Insituform Process provided the user thereof with significant advantages not obtainable through the use of the Everson method. In fact, at the time of infringement, the Insituform Process was the method of choice in CIPP work and used almost exclusively by Insituform and Defendants. These benefits of a more efficient process including its cost advantages are directly attributable to the patented technology and have contributed significantly to the popularity and commercial success of the Insituform Process.

Defendants argue that "another [acceptable noninfringing method] was the 'omit the duct tape' method [Process 3] recommended by Inliner on or about October 3, 1995, immediately after this Court's finding of infringement and stipulated by the plaintiffs to be non-infringing." (Defendants' Trial Brief at 9). However, as the court in *Panduit* found "[t]he post-hoc circumstance that [Defendants], when finally forced to

obey the court's injunction, was successful in 'switching . . . to a noninfringing [process], does not destroy the advantage recognition attributable to the patent over the prior. . . years." *Panduit*, 575 F.2d at 1162.

Furthermore, the fact that Insituform and Defendants are competitors strengthens the patent owner's bargaining position and weighs against fixing a lower royalty rate. *See Rite-Hite v. Kelley Co., Inc.*, 774 F.Supp. 1514, 1543 (E.D. Wis. 1991) ("Where ... the plaintiffs and defendant are competitors, the patent holder will be entitled to a higher royalty rate"), *vacated in part on other grounds by* 56 F.3d 1538 (Fed. Cir. 1995); CHISUM, *supra* at §20.03 (stating that the patent owner's bargaining power would be greater if it was a competitor of the infringer). The Court also finds that, contrary to Bratic's report, the '012 does have value independent of Insituform's other patents. Sequential vacuum impregnation under the '012 is, as stated earlier, more efficient and cost effective than other technology available at the time of infringement. In fact, the City of Houston required that sewer rehabilitation in the, Sims-Bayou Collection System be "accomplished by the use of the 'Insituform Process' or an approved equal." (Plaintiffs' Ex. 25A).

Another relevant factor is the collateral benefits Insituform received from the patented technology such as ITT's profits from liner sales ancillary to CIPP projects. *See Jenn-Air Corp. v. Penn Ventilator Co. Inc.*, 394 F. Supp. 665, 669 (E. D., Pa. 1975) ("The fact that a licensee would be able to sell the related non-infringing products would be a significant consideration in the hypothetical negotiations between a willing licensor and a willing licensee."). Under the entire market rule, a patentee is

entitled to damages from the sale of unpatented components sold with a patented apparatus when "the patent-related feature is the 'basis for customer demand.'" *Rite-Hite*, 56 F.3d at 1549 (quoting *State Industries, Inc. v. Mor-For Industries, Inc.*, 883 F.2d 1573, 1580 (Fed. Cir. 1989)). Therefore, for the entire market rule to apply, "the unpatented components must function together with the patented component of a single assembly or be parts of a complete machine, or they must constitute a functional unit." *Id.* at 1550. The Court finds that the various steps (including the products used in the performance of these steps) involved in the impregnation process, such as inverting the pipe with a tubular liner, cannot be considered in isolation but must be considered as a "functional unit", thereby entitling BV to include in the damage computation for reasonable royalty purposes ITI's profits on liner sales.

In addition to the above, however, the Court must also consider the following. Although the '012 patent has value and worth apart from Insituform's other patents, it is questionable whether Insituform had the capacity to perform all of the work Defendants completed with the use of the infringing processes. Steve McElyea, an engineer employed by Insituform from 1990 until 1994, testified that at the time of infringement there was tremendous growth in the CIPP industry and that IGS was not staffed to satisfactorily complete more projects than it had then undertaken. Sam Ellis ("Ellis"), a former Insituform employee, testified that there were, in the performance of certain jobs between 1990 and 1995, substantial delays due to a lack of skilled personnel and equipment necessary to complete the pipe rehabilitation procedure. Clearly, Insituform's relative bargaining strength decreases in absence of proof estab-

lishing that it had the capacity to perform the infringing production. *Syntex (U.S.A.) Inc. v. Paragon Optical Inc.*, 8 USPQ2d 1001, 1026-27 (D. Ariz. 1987) (stating that since the exclusive licensee under the patent had the capacity to meet the demand the infringer "would have been desperate for a license"); CHISUM *supra* at § 20.03[3] (stating that the patent owner's bargaining strength would be greater if it "had capacity to make the infringing sales or production"). This is in turn could have a bearing on the range of the reasonable crossover fee recoverable by BV.

C.J. Smith, the Director of Public Works for the City of Houston, testified that the City preferred, but did not mandate, competitive bidding and that in some instances the City would not award a contract unless more than one bid had been submitted for the job. Thus, CAT/Inliner's presence as a competitor to Insituform may have had the effect of increasing the overall number of possible CIPP jobs or at a minimum, expedited the procedure by which a municipality awarded CIPP contracts. Finally, Bratic testified that CAT/Inliner's anticipated gross margin from CIPP installations at the time of infringement was 25% and actual gross margin was 9.72%, rendering it almost fiscally impossible for CAT/Inliner to have, over the period of infringement, paid a high royalty rate.

With respect to the damages sustained by Insituform based on lost profits on jobs performed by CAT/Inliner, the Court has already determined that the actual profits which would have been recoverable by IGS cannot be considered due to lack of standing. There are three other components to those damages, however, that are recoverable by the patent owner-the defacto royalty from lost profits on the liners (under the entire market rule), the

royalty that it would have received had the infringer been licensed and any reasonable crossover fee.

In assessing the royalty base, Insituform has proposed that the value of the contracts awarded to CAT instead of IGS, its own licensee, is $50,212,379. (Plaintiffs' Ex 61, Schedule A-5). Defendants proposed total is $43,073,367 which according to Defendants expert, Bratic, does not include jobs after 10-3-95 when CAT began using the non-infringing Process 3. (Defendants' Ex. 21, Analysis of Reasonable Royalty Chart). The Court agrees that it is reasonable to use the lower total for the value of contracts proposed by Defendants as the evidence supports Defendants' assertion that they began using, the non-infringing method after October 3, 1995. The parties also disagree on the calculation of the royalty base to be applied to that figure. All parties agree that deductions of 14.63% from the contract total are reasonable. Defendants believe that an additional 12.12% of costs attributable to other work performed as part of the wet out or rehabilitation process should be deducted, including cleaning, remote camera inspection, trimming the end and inspecting the entire length of the pipe at the conclusion of the job. The Court disagrees. These costs are attributable to functions which are clearly a necessary and integral part of the overall patented process. The Court finds that under the entire market rule, it is not reasonable to exclude the costs of these additional items from the contracts in calculating the royalty base. Accordingly, the Court will use a royalty base of 85.37%. The royalty base rate of 85.37% multiplied by the value of contracts lost of $43,073,367 results in a royalty base of $36,771,733.

In computing the reasonable royalty, Insituform's expert, Goldscheider, stated that an appropriate mea-

sure of damages would be equivalent to one half of the total sum of the 9% royalty plus the 9% defacto royalty rate. That amount would then be added to the 12% crossover fee, yielding a royalty rate of 20.5%.

In determining the reasonableness of royalty, courts give considerable weight to evidence of the anticipated profits the infringer would have derived from the use of the patented technology. *Faulkner v. Gibbs*, 199 F.2d 635, 640 (9th Cir. 1952) (holding that "the gross receipts and profits of the infringer are considered" in assessing a reasonable royalty). Evidence of actual profits may also be considered. *Trell v. Marlee Electronics Corp*. 912 F.2d 1443, 1446 (Fed. Cir. 1990). However, "the reasonable royalty rated does not reflect the infringer's actual profits, but rather the parties' expectations and bargaining positions at the time of the first infringement." *Micro Motion Inc. v. Exac Corp*., 716 F.Supp. 1420, 1434; *see TWM Mfg. Co. Inc. v. Dura Corp.*, 789 F.2d 895, 899 (Fed. Cir. 1986) ("Although evidence of actual profits is generally admissible. . . the district court correctly focused on the date when the infringement began."). "If a rule were to be applied limiting post-infringement court determination of royalties to the infringer's actual profits, the effect would be to insure the infringer against losses in those situations where actual profits are less than the royalty level that would have been freely negotiated prior to the infringement." *Paper Converting Mach. Co. v. FMC Corp*., 432 F.Supp. 907, 916 (E.D. Wis. 1977). The Court may not, though, overlook the fact that it is "implicit in the 'reasonable royalty' methodology that the infringer would be left with a reasonable profit.... " *Century Wrecker v. E.R. Buske Mfg. Co. Inc*., 898 F.Supp. 1334, 1337-38 (N.D. Iowa 1995); *see also Zegers v. Zegers*, 458 F.2d 726, 728 n. 8

(7th Cir. 1972) (stating that it is unreasonable to assume that the infringer "would be willing to pay 100% of his [anticipated] profits to the patentee in exchange for a license"); *W.L. Gore & Associates, Inc. v. International Medical Prosthetics Research Associates, Inc.*, 16 USPQ2d 1241, 1257 (D. Ariz. 1990) ("In a free market, a willing licensee would not agree to a royalty that exceeded anticipated profits."). Moreover, "the fact that, as events unfurled after the hypothetical royalty negotiations, the defendant would not actually have made a profit paying the royalty so determined is irrelevant." *Century Wrecker*, 898 F.Supp at 1337-38.

Bratic testified that the anticipated gross profits at the time this contract would have been negotiated were 25%. Although CAT/Inliner's actual gross profits turned out to be only 9.72%, the Court is not bound to use that figure in determining what would have been a reasonable royalty rate. *Century Wrecker*, 898 F.Supp at 1337-38. The Court does find the actual gross profit figure useful, however, in determining what might have been a reasonable royalty rate at the time negotiations would have taken place. As anticipated profits were 25%, the Court is bound to consider that as the upper limit in determining what a reasonable royalty rate might have been. *See* COLLIER'S, *supra* at §20.03[3] (stating that "it is usually error to award all of the anticipated profits to the patent owner because a licensee would only enter into a hypothetical license on the supposition that he would make a reasonable profit"). The Court must also consider what would have been a reasonable profit for the infringer to make and finds the historical figure that has been provided here helpful in that regard. Assuming that 9.72% would have been a reasonable profit and that anticipated gross profits were 25% at the time, the

Court finds that a reasonable royalty rate would have been 15.28%. Accordingly, the Court finds that damages should be calculated by multiplying the reasonable royalty rate of 15.28% times the royalty base of $36,771,733, for actual damages related to the Gulf Coast Market of $5,618,727.[9]

With respect to the Sims-Bayou Contracts, the parties have stipulated that Process One was used by CAT/Inliner and Michigan Sewer in the performance of the Sims Bayou Contracts and that CAT/Inliner and Michigan Sewer are jointly and severely liable for any damages caused as a result such infringement. Michigan Sewer is jointly and severally liable with CAT/Inliner only for the jobs in which they were involved. The evidence shows that Michigan Sewer was involved in only four contracts which were performed in 1990 and 1991. The total revenue on those jobs was $5,967,647. Applying the royalty base rate of 85.37% results in a reasonable royalty base of $5,094,580. Applying the same reasonable royalty rate of 15.28%, the damages for which Michigan is jointly and severally liable are $778,452. Prejudgment interest on that amount only is $932, 110. 10. [10]

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[9] Damages will not be assessed against Americas, which was added by the permission of the Court after the 1995 trial, since there is no evidence in the record to show that Americas either directly infringed the '012 patent or induced the infringement of its licensees.

[10] The recovery of prejudgment interest is discussed in detail in section IV part E of this opinion.

B. Remainder or the United States Market (Active Inducement Liability)

Section 271(b) of the Patent Act provides that "whoever actively induces infringement of a patent shall be liable as an infringer." 35 U.S.C. § 271(b). A defendant induces infringement under section 271(b) "by actively and knowingly aiding and abetting another's direct infringement." *C.R. Bard, Inc. v. Advanced Cardiovascular Systems, Inc.*, 911 F.2d 670, 674 (Fed. Cir. 1990). Absent proof that the defendant "possessed specific intent to encourage another's infringement and not merely that the defendant had knowledge of the acts alleged to constitute infringement" there can be no liability for active inducement under section 271. *Manville Sales Corp v. Paramount Systems, Inc.*, 917 F.2d 544, 5 53 (Fed. Cir. 1990); *see also Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469 (Fed. Cir. 1990) (holding that 'proof of actual intent to cause the acts which constitute infringement is a necessary prerequisite to finding active inducement").

To satisfy the intent requirement, the plaintiff must show "the alleged infringer's actions induced infringing acts *and* that he knew or should have known his actions would induce actual infringement." *Manville*, 917 F.2d at 553 (emphasis in original). Thus, a plaintiff cannot prevail on a claim for inducement unless he can show the following: "(1) an inducer's knowledge of the asserted patent; (2) the presence of direct infringement by the third party allegedly induced; [and] (3) an inducer's actual intent to cause the acts which 'he knew or should have known would induce actual infringement.'" *Black & Decker (US) Inc. v. Catalina Lighting, Inc.*, 953 F.Supp. 134, 138 (E.D. Va. 1997); *see also Young Denial Manufacturing Ca. v. Q3 Special Products, Inc.*, 891

F.Supp. 1345, 1348 (E.D. Mo. 1995) (holding that to show the defendant actively induced infringement the plaintiff must show both "an act by the alleged defendant knowingly intended to induce another to infringe" and "the actual infringement by the third party").

1. KM

KM argues that Plaintiffs have failed to prove that it possessed the requisite mental state for inducement liability. KM asserts that it "did not know of the existence of the '012 patent prior to February 2, 1990, the filing date of the lawsuit" and that, as a result of this lack of knowledge, the Court cannot consider following acts as proof of inducement:

> (1) [t]he demonstration in Germany of the two cup German Inliner vacuum impregnation technique, which occurred in early March, 1989; (2) [t]he March 17, 1989, Letter of Intent between Kanalsanierung and... and Cat respectively; (3) the unexecuted license agreements between Kanalsanierung and Cat and (4) [t]he 'To Whom It May Concern' letter, which is dated November 10, 1989." (Defendant Kanalsanierung Hans Mueller GmbH & Co., KGs Motion for Judgment on Partial Findings, Instrument No. 450 at 5-6) (citations omitted). Moreover, KM contends that after "January 1, 1990, the responsibility and authority for licensing the German Inliner process was transferred from Kanalsanierung to a different company, [KMG]," which is not a party to this suit. *Id.* at 8. Finally, KM maintains it did not have knowledge of or control over CAT's development of Process 2 and thus, could not have "intended to cause the acts (using the Multiple needle vacuum impreg-

> nation technique) that constitute[d] the infringement of the '012 patent." *Id.* at 9.

Insituform argues that "[i]t makes no difference, from a scienter point of view, whether the German defendant was aware of the specific identity of each of the relevant Insituform patents. It is sufficient that it knew that Insituform had United States patents which would very likely be infringed." (Plaintiffs' Answer to Defendant Kanal Sanierung's Motion for Judgment on Partial Findings, Instrument No. 455 at 3). Moreover, Plaintiffs claim that "[w]hether needles or cups were used" is "totally irrelevant." *Id.* at 4. "[I]t was sequential vacuumization which the German defendant induced Cat/Inliner to carry out, and it is sequential vacuumization which is the subject matter of the '012 patent." *Id.*

The evidence in the record shows that KM informed Catallo of its prior patent litigation with Insituform and advised Catallo to obtain legal advice regarding the possibility for infringement of the United States' counterparts to Insituform's European patents. The process KM taught CAT/Inliner did not infringe Insituform's European patents and there is no evidence that KM was aware of or should have been aware of Insituform's patent situation in the United States. Nor is there any basis to conclude that KM could reasonably foresee that a variation of the process it taught CAT/Inliner would be infringing in the United States. "[I]t is clear under section 271(b) an accused infringer must be shown to have actual knowledge of the patent and the infringement and have the actual intent to induce the infringement." *Dynamics, Inc. v. Leepoxy Plastics, Inc.*, 931 F.Supp. 651, 657 (N.D. Ind. 1993).; *see also State Industries, Inc. v. A.0. Smith Corp.*, 751 F.2d 1226, 1236 (Fed,

Cir. 1985) ("To willfully, infringe a patent, the patent must exist and one must have knowledge of it."). Absent such proof, KM cannot be held liable for active inducement.

2. CAT/Inliner

Defendants argue that there is no evidence from which it can be determined that their licensees used the infringing process or that they induced such infringement. In an effort to secure this proof, Insituform prepared a questionnaire to be propounded to the licensees.[11] To encourage the licensees to answer those questionnaires the parties entered on January 7, 1997, into certain stipulations designed to resolve some disputed fact issues. The parties stipulated to the following:

> Before October 3, 1995, Inliner taught Process 2 (as defined in the court's Findings of Fact) to all of its licensees as part of its obligation under its license agreements with those licensees and recommended the use of that process. Inliner believes that its licensees have used that process for all but relatively short liner lengths (where it is thought that the Everson Process was used) in connection with work on which the licensees paid royalties to Inliner, that such has been the case on those occasions when Inliner personnel have observed or been informed with respect to licensee activities, and for

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[11] The questionnaire originally had eight questions. However, in the parties' stipulation they agreed that "for purposes of this litigation the answers to the same information [contained in question 8] from Inliner and Cat will be used for the Licensees information as well, just as if the Licensees had answered Question No. 8. Question 8 contained the following subpart: "Percentage of Impregnation Done via Process 2." (Plaintiffs' Ex. 22).

> purposes of this proceeding and for all other purposes it is stipulated that in each of the activities up to October 3, 1995 with respect to which the licensees paid royalties to Inliner Process 2 was employed at least to some extent, unless the contrary is shown.
>
> In October of 1995 Inliner taught all of its licensees a third process . . . and recommended its use. Inliner believes that its licensees have used that third process to the exclusion of Process 2 in connection with work on which licensees paid royalties to Inliner, that such has been the case on those occasions when Inliner personnel have observed or been informed with respect to licensee activities, and for purposes of this proceeding and for no other purposes, it is stipulated that in each activity subsequent to October 3, 1995 with respect to which the licensees paid royalties to Inliner that third process was employed and Process 2 was not employed, unless the contrary is shown.

(Plaintiffs' Ex. 22). The parties further agreed that "[i]f any licensee does not cooperate in voluntarily providing the requested information, then the parties agree that the questions will be posed via deposition on written question or oral deposition as counsel may choose." (Plaintiffs' Ex. 22 at 2).

The responses to the questionnaires were admittedly less than satisfactory. The Court believes that this was due, in no small part, to the actions of Defendants in publishing statements in trade publications and in disseminating letters which implied that the findings of

this Court would be reversed.[12] In one such letter, CAT/Inliner stated that:

> The United States Court of Appeals for the Federal Circuit ("CAFC") reached a decision in the appeal of the District Courts infringement findings, amount [sic] other things decided by the District Court.
>
> The CAFC affirmed the Court's findings and conclusions of no literal infringement from the 1991 trial. The CAFC also vacated the District Court's findings and conclusions relating to infringement under the Doctrine of Equivalents from the 1995 trial and remanded this same issue back to the District Court, with instructions regarding claim construction. This is great news. In essence, we won! However, the case is not over.

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[12] On April 2, 1996, Insituform filed a motion to hold Defendants in contempt of the Court's injunction prohibiting the use of Process 1 or 2 in connection with any work done by Defendants and their licensees. On June 14, 1996, the Court held a hearing on Insituform's motion. At this time, Insituform brought to the Court's attention the fact that CAT/Inliner had circulated a press release within the financial community, published a journal article in a trade journal and distributed a memo amongst its licensees containing both unfounded allegations concerning conduct on the part of Insituform which Defendants deemed to be fraudulent and misleading information regarding the validity of the Court's judgment of infringement and the potential for recovery of any damages. (Plaintiffs' Exs. 35-38). The Court pointed out that irreparable damage had already been done and admonished Defendants to cease any further attempt to manipulate public opinion, to negatively influence their licensees or otherwise lead them to noncompliance with Court orders or future discovery relating to the damages portion of the case.

> The practical effects of the CAFC decision are multifaceted and briefly explained below:
>
> First, there is now no finding of infringement of the Insituform vacuum patent ("012"), literally or equivalently. Insituform cannot claim otherwise to your customers.
>
> *Second, the damages trial predicated upon infringement is now moot and all related activities will cease.*
>
> Third, the "Monitoring Order" that allows Insituform to inspect on a monthly basis is moot and all related activities will cease.

(Plaintiffs' Ex. 38) (emphasis added). As a direct result of these types of false and misleading statements, only two questionnaires were returned by CAT/Inliner licensees from which this Court can evaluate CAT/Inliner's. Because this limited statistical sampling was caused by no fault of Insituform, the Court will not, as Defendants have requested, limit Insituform's damage claim for lack of supporting proof. Instead, the Court will rely on these questionnaires in making its determination regarding the extent to which the licensees used the infringing methods and were induced to do so by the Defendants.

The questionnaires were submitted by Reynolds, Inc. ("Reynolds") and Lanzo Lining Systems, Inc. ("Lanzo Lining"). Reynolds lining admitted that it used Process 2 in all work it performed prior to October 3, 1995, and that Process 2 was taught to it by CAT/Inliner. Reynolds also listed the individual jobs in which Process 2 was used and the amount of royalties it paid to CAT/Inliner on such jobs. Lanzo Lining claimed to have used Process

1 in 100% of its contracts. However, in response to the following question:

> Was knowledge of the vacuum impregnation process or processes that were carried out imparted to you by CAT/Inliner or persons acting for CAT/Inliner, or was it information CAT/Inliner should have disclosed to you pursuant to the terms of the license agreement with them?

Lanzo stated that "We expected to get directives from Inliner representatives and we *did.*" (Plaintiffs' Ex. 24).

While the parties stipulated that Defendants taught Process 2, they did not negate the possibility that Defendants also taught Process 1. In fact, the parties' stipulation was specifically limited by the statement "unless the contrary is shown". The response of their licensee, Lanzo Lining, clearly indicates that Defendant did teach or give directives about Process 1. Accordingly, the Court finds that the stipulations and statistical evidence, when taken together, show that Defendants taught their licensees both processes found to have been infringing by the Court and that at least 50% of their licensees used Process 1 and at least 50% of them used Process 2.

With respect to the damages sustained by Insituform based on lost profits on jobs performed by the Inliner licensees and on CAT contracting jobs outside of the Gulf Coast Market, Insituform asserts and the Court agrees that the royalty revenue totals $30,684,385 (CAT jobs totaling $1,344,372 and licensee jobs totaling $29,340,013. (Plaintiffs' Ex. 61, Schedule A-6, A-7 & A-

8).[13] To that figure Insituform proposes using a reasonable royalty rate of 20.5%. For the reasons states above, the Court will use a royalty rate of 15.28%. Based on this rate, the Court finds that damages related to the work by CAT/Inliner licensees and by CAT jobs outside of Gulf Coast market totals $4,688,574.

3. Michigan Sewer

There is no evidence in the record proving that Michigan Sewer actively induced others to infringe the '012 patent. As such, Michigan Sewer cannot not be held liable for inducement.

C. Enhanced Damages

Section 284 authorizes the court to "increase the damages up to three times the amount found or assessed." 35 U.S.C. § 284. The decision to award enhanced damages is "committed to the district court's discretion." *Spindelfabrik Sussen-Schurr Stahlecker & Grill v. Schubert Salzer Maschinenfabrik Aktiengesellschaft*, 829 F.2d 1075, 1083-84 (Fed. Cir. 1987). However, "[i]n order to support such an increased, punitive award there must be a finding that the infringement was willful. The existence of honest doubt concerning the validity of a patent precludes a finding of willfullness." *Eltra Corp. v. Busic Inc.*, 599 F.2d 745, 757 (6th Cir. 1979); *Enterprise Mfg. Co. v. Shakespeare Co.*, 141 F.2d 916, 921 (6th Cir. 1944) ("If honestly mistaken as to a reasonably debatable question of validity, an infringer should not be made to smart in punitive damages. Compensatory damages constitute adequate

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[13] The CAT contracting figure reflected on schedule A-6 is incorrectly listed as $1,574,759 instead of $1,344,372 - the royalty base amount.

remuneration for invasion of a patentee's property rights, unless the refusal of the infringer to bow to the presumptive validity of an issued patent is consciously wrongful."). Furthermore, "[a]n increase in damages for willfullness. . . is generally inappropriate when the infringer mounts a good faith and substantial challenge to the existence of infringement." *Paper Converting Machine Co. v. Magna-Graphics Corp.*, 745 F.2d 11, 20 (Fed. Cir. 1984).

Whether infringement is willful is "by definition a question of the infringer's intent", which may be "resolved by evaluating the totality of the surrounding circumstances." *Ortho Pharmaceutical Corp. v. Smith*, 959 F.2d 936, 943 (Fed. Cir. 1992); *Gustafson, Inc. v. Intersystems Industrial Products*, 897 f.2d 508, 5 10-511 (Fed. Cir. 1990) ("Whether an act is 'willful' is by definition a question of the actor's intent, the answer to which must be inferred from all circumstances."). The following factors have been utilized in assessing the infringer's culpable state at the time of the infringement:

> (1) whether the infringer deliberately copied the ideas or design of another; (2) whether the infringer, when he knew of the other's patent protection, investigated the scope of the patent and formed a good-faith belief that it was invalid or that it was not infringed, and (3) the infringer's behavior as a party to the litigation.

Bott v. Four Star Corp., 807 F.2d 1567, 1572 (Fed. Cir. 1986); see also *National Presto Industries, Inc. v. West Bend Co.*, 76 F.3d 1185, 1193 (Fed. Cir. 1996) (stating that the following may be considered as factors in determining whether infringement was willful: "whether

the infringer exercised care to respect the legal rights of the patentee, whether sound legal advice was timely obtained, whether the actions taken were reasonable, whether there was copying or independent development by the infringer, and various aspects of the actual relationship between the patentee and the infringer"). Other factors that may be considered are: "(4) [d]efendant's size and financial condition; (5) [c]loseness of the case; (6) [d]uration of defendant's misconduct; (7) [r]emedial action by the defendant's; (8) Defendant's motivation for harm; [and] (9) [w]hether defendant attempted to conceal its misconduct." *Read Corp, v. Portec, Inc.*, 970 F.2d 816, 827 (Fed. Cir. 1992).

Finally, the risk of a finding of willful infringement increases when a potential infringer fails to obtain legal advice prior to engaging in possible infringing activity. "Where . . . a potential infringer has actual notice of another's patent rights, he has an affirmative duty to exercise due care to determine whether or not he is infringing." *Underwater Devices Inc. v. Morrison-Knudsen Co.*, 717 F.2d 1380, 1389-1390 (Fed. Cir. 1993). This affirmative duty includes "the duty to seek and obtain competent legal advice from counsel before the initiation of any possible infringing activity. " *Id.* at 1390. However, an opinion letter on validity or the failure to obtain such an opinion is not dispositive on the issue of willful infringement but must be considered in light of aforementioned factors.

Insituform contends that the following facts support its claim for enhanced damages: (1) CAT/Inliner failed to perform a index search at the U.S. Patent Office for patents owed by Insituform prior to commencing its infringing activity; (2) once it learned of the '012, CAT/Inliner did not obtain a written opinion regarding the

possibility of infringement of the '012; (3) CAT/Inliner indemnified its licensees against all damages &rising from infringement of the Insituform patent and such indemnification agreements were executed after the jury in the first trial found the '012 to be valid; (4) CAT/Inliner has engaged in "excessive and unjustified motion practice"; (5) CAT/Inliner's argument against infringement-that prosecution history of the '012 patent estopped Insituform from claiming infringement by Process 1 or 2 under the doctrine of equivalents-was unreasonable and (6) CAT/Inliner published in trade and other similar journals distributed within the financial community false statements wrongfully accusing Insituform of engaging in fraudulent conduct, inaccurately describing the judgment rendered by the Federal Circuit and imparting misinformation regarding the potential for a new trial to be granted. (Plaintiffs' Consolidated Pretrial Memorandum at 50-54).

In contrast, CAT/Inliner argues that its acts, which the Court ultimately found to be infringing, "were carried out with the advice of counsel, and in the good faith belief that they did not constitute infringement or would not be found to be infringing". (Defendants' Motion for JMOL on Inducement to Infringe and Willfulness Issues, Instrument No. 443 at 3-4).

While CAT/Inliner are correct that a good faith belief of noninfringement precludes a finding of willfullness, see *Elrra Corp v. Basic, Inc.*, 599 F.2d 745, 757-58 (6th Cir. 1979) ("The existence of honest doubt concerning the validity of a patent precludes a finding of willfullness."); *Yoder Bros. Inc. v. California-Florida Plant Corp.*, 537 F.2d 1347, 1383-84 (5th Cir. 1976) ("Where the issue of patentability is close and litigated in good faith, the court should be more reluctant to

impose punitive damages."), the Court rinds that the evidence in the record does not support CAT/Inliner's position that their conduct in infringing was based on their mistaken belief that neither Process 1 or 2 infringed the '012.

After suit was filed against CAT/Inliner alleging infringement of the '012 patent, Catallo testified that he obtained an oral opinion from Knoll that the process used by CAT/Inliner did not infringe the '012. Catallo never obtained, as he did with the '063 and '345 patents, a more comprehensive evaluation or a written opinion regarding the '012 patent and CAT/Inliner's potential infringement thereof.[14] *See National Presto Industries, Inc. v. West Bend Co.*, 76 F.3d 1185, 1193 (Fed. Cir. 1996) (finding willfullness when, among other reasons, defendant did not timely obtain a written opinion regarding possible infringement). Catallo simply relied on Knoll's conclusion that the '012 was valid and unenforceable and his own personal belief that there was no infringement. "Obtaining a conclusory opinion of counsel letter after the manufacture of the infringing device and after a notice of infringement has been received from the patentee does not indicate good faith." *Dickey-John Corp. v. International Tapetronics Corp.*, 710 F.2d 329, 348 (Fed. Cir. 1983).

In *Underwater Devices Inc. v. Morrison-Knudsen Co.*, the Federal Circuit held that for an opinion of noninfringement to be competent it should, at a minimum, contain a patent validity analysis "explicitly predi-

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[14] The written opinion concerning the '063 and '211 was very detailed, containing a review of the prosecution history of the two patents and an analysis regarding both literal infringement and infringement under the doctrine of equivalents.

cated on a review of the file histories of the patent at issue, and an infringement analysis that, *inter alia*, compared and contrasted the potentially infringing method... with the patented inventions." 717 F.2d 1380, 1390 (Fed. Cir. 1983); *see also Read*, 970 F.2d at 929 (stating that an opinion may be deemed incompetent when an attorney failed to "look [ ] into the necessary facts" because "there would be no foundation for his opinion"). The opinion rendered in the instant case failed to meet this standard. Nor was there any proof that Knoll either evaluated the possibility that Process 1 or 2 infringed under the doctrine of equivalents or consulted the '012 prosecution history before rendering her opinion. *See Datascope Corp. v. SMEC, Inc.*, 979 F.2d 820, 828 (Fed. Cir. 1989) (finding willfulness where the opinion at issue "said nothing whatever about the validity of the '339 patent or any Datascope patent, and the opinion's reference to infringement is not only conclusory, but ignores entirely the question of infringement under the doctrine of equivalents"). Had there been such an analysis, Knoll may have concluded as did the Federal Circuit in its November 6, 1996 opinion that "it cannot be said that a reasonable competitor could conclude that Insituform" relinquished coverage of processes using either multiple vacuum sources or a continuous vacuum." (Instrument No. 368 at 20). Moreover, there is no evidence that the switch to Process 2 was based on anything other than Catallo's and Knoll's unsupported belief that using needles instead of cups would make infringement less likely. "An alleged infringer who intentionally blinds himself to the facts and law, continues to infringe, and employs the judicial process with no solidly-based expectation of success, can hardly be surprised when his infringement is found to

be willful. " *Kloster Speedsteel AB v. Crucible, Inc.*, 793 F.2d 1565, 1580 n. 11 (Fed. Cir. 1986)

In addition, the Court finds that CAT/Inliner's bad faith conduct and improper litigation tactics further warrants a finding of willfulness. In February of 1996, CAT/Inliner released for publication various statements regarding this suit that were plainly incorrect and intentionally designed to not only to malign Insituform but also mislead readers as to the propriety of CAT/ Inliner's continued use of technology covered by the '012 patent. In a press release dated February 23, 1996, CAT/Inliner announces that it "has filed a motion for new trial based on newly discovered evidence and on the ground of fraud and misconduct by Insituform." CAT/ Inliner then asserts that it "uncovered seemingly irrefutable evidence of deliberate concealment of damaging evidence by Insituform in its apparent efforts to create the perception of validity and enforceability of a United States Patent owned by Insituform. " (Plaintiffs' Ex. 35). This evidence, CAT/Inliner proclaims, "supports [its) continuing argument that Insituform has flagrantly misrepresented the validity and enforceability of the patent and has repeatedly, and in an organized manner, used the patent to restrict free trade in the marketplace over the last sixteen years." *Id.* There was no legally sufficient evidence of these claims produced in the instant action and CAT/Inliner's motion for new trial (Instrument No. 276) was summarily denied on June 12, 1996. (Instrument No. 30 1). As stated earlier, the Court finds that this conduct on the part of CAT/Inliner was nothing more than a misguided attempt to redeem itself in the perception of public at the expense of Insituform's reputation and to withhold critical information regarding the actual nature of its activities over the preceding six years.

Therefore, due to a complete absence of competent advice regarding possible infringement of the '012 patent and a flagrant display of deliberate misconduct by CAT/Inliner throughout this proceeding, the Court finds that actions of CAT/Inliner's evidenced the degree of willfulness necessary to support the award of enhanced damages. The Court further finds that CAT/Inliner's willfull behavior justifies a 50% increase in the actual damages award for a total additional award of $5,153,650.

D. Attorney's Fees

Under section 285, "[t]he court in exceptional cases may award reasonable attorney fees to the prevailing party." 35 U.S.C. § 285. An award of attorney's fees under this section is within the discretion of the trial court but such an award must be based on a specific finding of exceptional circumstances, which must be proven by clear and convincing evidence. *See Cambridge Products, Ltd. v. Penn Nutrients, Inc.*, 962 F.2d 1048, 1050 (Fed. Cir. 1992) (holding that "the exceptional nature of the case must be established by clear and convincing evidence); *Hughes v. Novi American, Inc.*, 724 F.2d 122, 124 (Fed. Cir. 1984) ("While an award of attorneys fees is to be reviewed under the standard of whether such award constitutes an abuse of discretion, an award must be set aside if it is unsupported by adequate !findings of the basis for the award, thereby precluding meaningful review."); *Raytheon Co v. Roper Corp.*, 724 F.2d 122, 124 (Fed. Cir. 1983) (holding, that the court has the discretion to award attorney's fees).

"Exceptional circumstances" may include, but is not required to, willful or deliberate infringement or inequitable conduct engaged in by the defendant during litigation. *Avia Group International, Inc. v. L.A. Gear Califor-*

nia, Inc., 953 F.2d 1557, 1567 (Fed. Cir. 1989) ("Although an award of attorney fees, because discretionary, does not automatically follow from the willfulness of an infringement. . . the willfulness of the infringement by the accused infringer may be a sufficient basis in a particular case for finding the case 'exceptional' for purposes of awarding attorney fees to the prevailing patent owner."); *Kahn v. Dynamics Corp. of America*, 508 F.2d 939, 944-45 (2d Cir, 1974). "Because [willfulness of infringement] may be seen as producing an unnecessary and outcome-certain law suit, it may make the case so exceptional as to warrant attorney fees under § 285. Similarly, bad-faith displayed in pretrial and trial states, by counsel or party, may render the case exceptional under § 285." *Kloster Speedsteel, AB v. Crucible, Inc.*, 793 F.2d 1565, 1580 (Fed. Cir. 1986). However, the statute does not contemplate that "a prevailing alleged infringer should be treated as a 'private attorney general' for invalidating a 'fraudulent patent', Rather, the purpose is to provide discretion where it would be grossly unjust that the winner be left to bear the burden of his own counsel which prevailing litigants normally bear." *J. P. Stevens Company, Inc. v. Lex Tex Ltd, Inc.*, 922 F.2d 1047,1052 (Fed. Cir. 1987); *see also Modine Manufacturing Co. v. Allen Group, Inc.*, 917 F.2d 538, 543 (Fed Cir. 1990) ("[T]he decision whether or not to award fees is still committed to the discretion of the trial judge, and '[e]ven an exceptional case does not require in all circumstances the award of attorney fees'".) (quoting *S. C. Johnson & Sons, Inc. v. Carter Wallace, Inc.*, 781 F.2d 198, 201 (Fed. Cir. 1986)). In cases where there has been an express finding of willfulness, the trial court must, in denying attorney fees, "explain why the case is not 'exceptional within the meaning of 35 U.S.C. Section 285." *Modine Manufactur-*

ing, 917 F.2d at 543. The Court finds Insituform has, based on both CAT/Inliner's willful infringement and bad faith conduct during this trial, proven, by clear and convincing evidence, the exceptional nature of this case. *See Avia Group International, Inc. v. L.A. Gear California, Inc.*, 853 F.2d 1557, 1567 (Fed Cir. 1988) ("[T]he willfulness of the infringement by the accused infringer may be a sufficient basis in a particular case for finding the case 'exceptional' for purposes of awarding attorney fees to the prevailing patent owner."); *Kori Corp. v. Wilco Marsh. Buggies Draglines, Inc.*, 761 F.2d 649, 657 (Fed, Cir. 1985) ("Having found this to be a case of willful infringement, the district court's discretionary award of attorney fees and costs ... was proper). As such, this Court awards Insituform, as an extra measure of recovery, reasonable attorney fees.

The Court therefore orders the Plaintiffs to produce clear, complete and verified documentation of all attorney time, hourly fees and litigation expenses, if any, including all expert witness fees incurred in the representation of Defendant within ten (10) days of the date of this Order. Furthermore, counsel shall complete a table indicating the attorney or paralegal by name, hourly rate, total hours and total fees in a form substantially like the one referenced below. Counsel shall separately set forth the amount of costs and expenses incurred.

Timekeeper	Hours	Rate	Total
Expenses			
TOTAL			

The Court **FURTHER ORDERS** that Defendant shall have five (5) days after such documentation is produced to file any objections to Defendant's attorneys' fees, costs and expenses.

E. Prejudgment Interest

Insituform argues that they are "entitled to recover compounded pre-judgment interest at the prime rate." (Plaintiffs' Consolidated Pretrial Memorandum, Instrument No. at 55). In contrast, Defendants request that

since "Insituform did almost nothing to prosecute its infringement suit from the time Judge Hughes granted a JNOV and new trial until the case was reassigned to this Court. . . the Court to exclude this time period from the computation of prejudgment interest." (Defendants' Trial Brief, Instrument No. at 21). In addition, Defendants "suggest that the Court employ the statutory rate for post-judgment interest set forth in 28 U.S.C. §1961" and "use a simple interest approach only." *Id.*[15]

The district court has substantial discretion in determining whether prejudgment interest should be awarded, the rate of such interest and whether it should be compounded or uncompounded. *Datascope Corp. v. SMEC, Inc.*, 879 F.2d, 820, 829 (Fed. Cir. 1989); *Bio-Rad Laboratories, Inc. v. Nicolet Instrument Corp.*, 807 F.2d 964, 969 (Fed. Cir. 1986). In exercising that discretion, the Court must be guided by the United States Supreme Court's decision in *General Motors v. Devex Corp*, 461 U.S. 648, 654, 103 S.Ct. 2058, 2062 (1983). In *Devex*, the Court held that "prejudgment interest should ordinarily be awarded" so as to fulfill section 284's overriding purpose of "affording patent owners complete compensation" and "ensur[ing] that the patent owner is placed in as good a position as he would have been had the infringer entered into a reasonable royalty agreement." *Id.* at 654, 103 S. Ct. at 2062. According to the

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[15] Section 1961 provides in relevant part: [I]nterest shall be calculated. . . at a rate equal to the coupon issue yield equivalent (as determined by the Secretary of the Treasury) of the average auction price for the last auction price for the last auction of fifty-two week United States Treasury bills settled immediately prior to the date of judgment.. . . Interest shall be computed daily to the date of payment. . . .

28 U.S.C. § 1961.

Court, "[a]n award of interest from the time that the royalty payments would have been received merely serves to make the patent owner whole, since his damages consist not only of the value of the royalty payments but also of the foregone use of the money between the time of infringements and the date of the judgment." *Id.* In this case, the Court finds that to make Insituform whole and an award of prejudgment interest should be made for every year since the infringement began without regard to the unusual length of this lawsuit as Defendants have the use of Insituform's money even during that period of delay.

In the instant case, this Court finds that the most appropriate rate to be used to calculate prejudgment interest is the rate specified by Texas law. Under Texas law, prejudgment interest should be calculated according to section 304.003 of the Finance Code which provides that the interest rate should be 10 percent if, as in the instant case, the auction rate is less than 10 percent.[16] TEX. FIN. CODE ANN. § 304.003; *see also Oiness v. Walgreen Co.*, 88 F.3d 1025, 1033 (Fed. Cir. 1986) (holding that the district court did not abuse its discretion by awarding prejudgment interest at the state statutory rate rather than the rate requested by the patentee); *Kerwit Medical Products, Inc. v. N&H Instruments, Inc.* 224 USPQ 679, 691 (N.D. Tex. 1984) (finding that state statutory interest rate to be appropriate to apply to a prejudgment interest award) The Court also finds that the compounding of interest better accom-

[16] The auction rate under section 304.003 is "quoted on a discount basis for 52-week treasury bills issued by the United States government as most recently published by the Federal Reserve Board before the date of computation". TEX. FIN. CODE ANN. § 304.003. The auction rate as of the date of computation is 5.271%.

plishes the overriding purpose of an award of prejudgement interest-to make the patent owner whole by compensating him for the lost use of royalty income that he rightfully should have been paid. *See Styrker Corp. v. Intermedics Orthopedics, Inc.*, 891 F.Supp. 751, 833 (E.D.N.Y. 1995) (stating that "the prejudgment interest awarded should be compounded, because the incremental profits [the patentee] would have earned on the lost sales over the infringement period would have been invested in a manner resulting in yearly accrued growth").

Finally, prejudgment interest should be calculated from the time of the infringing activity. *Bio-Rad Laboratories, Inc. v. Nicolet Instrument Corp.*, 807 F.2d 964, 967 (Fed. Cir. 1986) ("The normal procedure under *Devex* is to award prejudgment interest from the date of infringement to the date of payment, since only such award will satisfy 'Congress' overriding purpose [in section 284] of affording patent owners complete compensation'") (quoting Davies U.S. at 655, 103 S.Ct. at 2062). In this case, the infringing activity began in 1990 with respect to infringement by CAT/Inliner and in 1993 with respect to infringement by CAT/Inliner licensees. Although the Court is unable to use the calculation of prejudgment interest prepared by Insituform, in Plaintiffs' Exhibit No. 61, schedule A9, as it includes calculation of interest on damages the Court has excluded and also calculates the interest at a higher royalty rate, the Court has utilized that table solely for the purpose of determining the percentage of loss attributable to each year that infringing activity occurred. Insituform will therefore be awarded prejudgment in-

terest, calculated at the rate of 10% per annum and compounded, annually, in the amount of $6,399,965.79.[17]

V. Conclusion

Accordingly, the Court awards the following in damages:

Reasonable Royalty on Gulf Coast Market jobs:	$5,618,727
Reasonable Royalty on jobs performed by CAT/ Inliner licensees:	$ 4,688,574
Actual damages:	$10,307,301
Prejudgment Interest	$ 6,399,965
Enhanced Damages	$ 5,153.65
Grand Total Damages	$21,860,917

After the conclusion of the trial, the parties filed the following motions: Motions for Judgment as a Matter of Law Because of No Standing and No Damages Proof by Defendants (Instrument No. 442); Motion for Judgment, as a Matter of Law on Inducement to Infringe and Willfulness Issues by Defendants (Instrument No. 443); Motion for Judgment as a Matter of Law by Inliner

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[17] Prejudgment interest was calculated by specifying the percentage of the actual damages of $10,307,301 for each year as follows: 1990 - $515,365 (5%); 1991 - $453,521 (4.4%); 1992 $412,292 (4%); 1993 - $2,195,455 (21.3%); 1994 - $3,329,258 (32.3%); 1995 - $3,401,409 (33%). Although the 1995 percentage is slightly inflated because of the inclusion by Insituform of CAT contracts performed after 10-3-95, it reflects a conservative estimate of the division of damages for purposes of calculating prejudgment interest since it inflates the amount of losses in a later year, thereby decreasing the total interest award.

Americas, Inc (Instrument No; 444); Motion for Judgment on Partial Findings by Kanal Sanierung Hans Mueller (instrument No. 450); and Motion Under Rule 21 and 15(a) to add Insituform North America Corp, A Tennessee Corporation and, if necessary Insituform (Netherlands) BV as a party or parties by Plaintiffs (Instrument No. 452). Because the issues raised by these motions have been addressed by the Court's Findings, each of the aforementioned motions will be **DENIED** as moot.

A final judgment will be entered following the Court's ruling on the issue of attorneys' fees incorporating these findings and the Court's findings in the revised findings of fact and conclusions of law entered on December 31, 1996.

The Clerk shall enter this Order and provide a copy to all parties.

SIGNED this 2nd day of September, 1998.

/s/ Vanessa D. Gilmore
VANESSA D. GILMORE
UNITED STATES DISTRICT JUDGE

APPENDIX G

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

INSITUFORM TECHNOLOGIES, INC.,
INSITUFORM (NETHERLANDS) B.V., AND
INSITUFORM GULF SOUTH, INC.,
Plaintiffs,
v.
CAT CONTRACTING, INC., MICHIGAN § SEWER
CONSTRUCTION COMPANY, KANAL
SANIERUNG HANS MULLER GmbH & CO. KG,
AND INLINER U.S.A.,
Defendants.

CIVIL ACTION NO. H-90-1690

UNITED STATES DISTRICT COURT,
SOUTHERN DISTRICT OF TEXAS
ENTERED DEC. 31, 1996
MICHAEL N. MILBY, CLERK

REVISED FINDINGS OF FACT
AND CONCLUSIONS OF LAW

This case was tried to the Court from February 21, 1995 to February 23, 1995. At the conclusion of the case, this Court entered findings of fact and conclusions of law (Instrument No. 238) finding infringement under the doctrine of equivalents. Inliner appealed this Court's order denying its motion for judgment as a matter of law on the invalidity claim, this Court's order denying its motion to amend other claims, and the Court's order finding infringement under the doctrine of equivalents.

The Federal Circuit has remanded this case to the district court for new findings on the issue of claim construction. The Court held that "... as the district court's doctrine of equivalents analysis was distorted by its incorrect claim construction, we must remand for new findings regarding this issue in accordance with the correct claim construction, ...". The issue of claim construction is a matter of law for the court to decide, involving the review of patent specifications, prosecution history, language of the patent claims, and, if necessary, extrinsic evidence. *Texas Instruments v. U.S. Int'l Trade Com'n*, 988 F.2d 1165, 1171 (Fed. Cir. 1993). The court must decide and explicate its findings regarding claim construction on the record. *Genentech, Inc. v. Wellcome Foundation Ltd.*, 29 F.3d 1555 (Fed. Cir. 1994). Once the claim of a patent is interpreted to determine its scope and meaning, the court, as the factfinder in this case, can determine whether the accused device is within the scope of the properly constructed meaning. *North American Vaccine, Inc. v. American Cyanamid Co.*, 7 F.3d 1571, 1573 (Fed. Cir. 1993), cert. denied, 114 S.Ct. 1645 (1994). While the question of infringement is a question of fact, the Court has sufficient evidence before it to make a determination of infringement without additional proceedings. Accordingly, the Court issues the following "Second Amended Findings of Fact and Conclusions of Law:

FINDINGS OF FACT

Procedural History

1. In February 1990, Defendants were sued for infringement of U.S. Patents 4,009,063 of February 22, 1977 and 4,336,012 of December 18, 1982, both the inventions of Eric Wood and both now owned by Insituform Technologies, Inc.

2. In 1991, there was a jury trial of the issues of infringement and validity of the '063 and '012 patents. The jury returned a verdict finding validity and infringement as to both patents.

3. Defendants moved for judgment notwithstanding the verdict or new trials as to all issues. Judge Hughes granted Defendants' JNOV motions with respect to literal infringement of both patents, ordered a new trial with respect to the issue of infringement by the doctrine of equivalents of both patents, and denied Defendants' motion in all other respects.

4. Trial of the issues of recoverable damages as against each defendant has been bifurcated, and is not here involved, nor was it involved in the 1991 trial.

5. The '063 patent expired February 22, 1994. The parties have stipulated that it is no longer involved in this lawsuit.

Parties and Jurisdiction

6. Plaintiff Insituform (Netherlands) B.V. ("Insituform") is a corporation of the Netherlands, with a principal place of business at Herengracht 552, Amsterdam 1001, Netherlands. Insituform Technologies, Inc. ("ITI") is a Delaware corporation, having a principal place of business at 3315 Democrat Road, Memphis, Tennessee 38118. Insituform Gulf South, Inc. ("INS") is a Texas corporation, having a principal place of business at 131 North Richey, Pasadena, Texas 77506.

7. Defendant Cat Contracting, Inc. ("CAT") is a Michigan corporation, having its principal place of business at 2022 FM 528, Alvin, Texas, 77518. Michigan Sewer Construction Company ("Michigan Sewer") is a Michi-

gan corporation, having a principal place of business at 21720 West Eight Mile Road, Southfield, Michigan 48075. Kanal Mueller Gruppe International (KMG) is a corporation of the Federal Republic of Germany, having a place of business at 4938 Schieder-Schwalengerg, Federal Republic of Germany. Kanal Sanierung Hans Mueller GmbH & CO KG CKM"), is a licensee of KMO for the country of Germany. Inliner U.S.A. ("Inliner") is a corporation of the State of Delaware, having a principal place of business in Houston, Texas.

8. This Court has jurisdiction over the parties and the subject matter of this case 28 U.S.C. §§ 1331, 1338(a), 2201 and 2202. Venue is proper in the Southern District of Texas. 28 U.S.C. §§ 1391 and 1400.

Background

9. Sewer pipes and the linings of sewer pipes are subjected to stresses. That is particularly true in the case of underground sewer pipes. It is necessary that the lining be capable of withstanding those stresses for an appreciable period of time, as long as 50 years.

10. To accommodate those requirements, Eric Wood, through Insituform, pioneered a process in which the soft liners are made up of a relatively thick layer of felt which is impregnated with a thermosetting resin. (A thermosetting resin is a resin which, when subjected to heat, will become hard but which, before the heat is applied, is soft.) After the felt liner has been put in place within the pipe to be repaired and has been pressed outwardly so as to conform to the pipe, the resin is heated, by flowing hot water through the lining, causing the resin to set. The strength of the lining thus produced is primarily dependent upon the set resin which has impregnated the lining. It is essential, if the lining is to

have the desired strength and longevity, that the impregnation of the felt by the resin be substantially uniform.

11. Soft linings of the type in question are inserted in lengths that are usually many hundreds of feet long. When such linings are impregnated with resin they weigh many tons. Some jobs have involved the use of as much of 100 tons of resin. The felt that is used is quite dense and it is difficult to get the resin into the felt and ensure that the felt is substantially fully impregnated by the resin. A way needed to be found to achieve a substantially complete impregnation of felt linings of the size involved with the understanding that the presence of any substantial amount of air in the liner after impregnation would be unacceptable.

12. The major impediment to uniform impregnation of the felt by the resin is the presence of air in the felt. The resin must displace the air, and do so substantially completely, if the felt is to be uniformly and satisfactorily impregnated.

13. Early on in the development of this technology, it was learned that the impregnation process would be greatly facilitated if air were to be sucked from the interior of the felt tube. During the impregnation process, a method was utilized where a vacuum pump was connected at the far end for the lining and air was sucked out of the lining from that far end until a satisfactory vacuum was created in the lining. That is what is shown in Everson patent 4,182,262 of 1980 and in the British Rhys-Jones article of 1975. It took a very appreciable length of time before sucking air from the free end of the liner produced a satisfactory vacuum at the point in the liner where the resin was beginning to

enter the felt (the "resin front"), and impregnation could not start until that had been accomplished. The lengths of the liners used at the time of Everson and Rhys-Jones were relatively short, however, so the length of time involved was marginally acceptable. As the length of the liners increased, the time needed to produce the desired vacuum at the resin front increased as the square of the distance involved — a liner twice as long would need four times as much time, and a liner four times as long would need sixteen times as much time. It is to this problem that the patent in suit, 4,366,012 of December 28, 1982, is directed.

The Patent In Suit

14. When Mr. Wood filed the patent application, original claim 1 called broadly for the application of the vacuum while the impregnation process is taking place. Original claims 2 and 3 added to claim 1 that the resin was introduced into one end of the tube and fed down the tube by means of nip rollers and the vacuum was applied to the interior of the tube downstream of the resin mass. Original claim 4 added to the above that the vacuum was applied through a window formed in the wall of the tube by means of a cup connected to a source of vacuum, the cup moving with the tube during its movement relative to the nip rollers, and the cup being removed and applied to a position spaced downstream from the previous window, the previous window being sealed by means of a patch or the like, whereby the process is repeated for respective lengths of the tube until the entire tube length has been impregnated.

15. The Patent Examiner, in his first action on the merits, rejected all of those claims on the basis of the Everson patent, the Examiner saying: "The claimed

process does not appear to differ in any unobvious aspect from that of the reference."

16. In response, by amendment dated April 6, 1982, applicant canceled the original claims and added the claims that appear in the patent. Patent claim 1 reads as follows:

> a. A method of impregnating with a curable resin an inner layer of resin absorbent material disposed in an elongate flexible tube having an outer layer formed by an impermeable film, the method comprising the steps of
>
> (1) introducing into one end of the elongate tube a mass of the curable resin sufficient to impregnate the entire resin absorbent inner layer of the tube,
>
> (2) forming a window in the impermeable outer layer of the tube at a distance from said one end of the tube,
>
> (3) drawing through the window a vacuum in the interior of the tube downstream of said one end by disposing over the window a cup connected by a flexible hose to a vacuum source which cup prevents ingress of air into the interior of the tube while the tube is being evacuated, the outer layer of the tube being substantially impermeable to air,
>
> (4) beginning at or near the end at which the curable resin mass was introduced, passing the tube between squeezing members which force the resin to flow towards the region of vacuum application as the tube progresses through the squeezing members,

(5) when the resin reaches the vicinity of the region of vacuum application, removing the cup and sealing the window,

(6) providing another window in the impermeable layer of the tube downstream of the previously formed window,

(7) drawing through the new window a vacuum in the interior of the tube while progressively moving the tube through the squeezing members to force the resin to flow toward the new region of vacuum application, and

(8) repeating steps 5, 6, and 7, where necessary to impregnate the entire resin absorbent inner layer of the flexible tube.

17. Applicant explained the similarity of the new claim to the original application claim 4 to the Examiner as follows: "(Application) Claim 10 (ultimately patent claim 1) incorporates the substance of canceled claims 1, 2, 3 and 4." Applicant's total argument to the Examiner as to the patentability of that claim was as follows:

> The principal reference relied on in the rejection of claims 1 to 6 is the patent to Everson (U.S. 4,182,262). Everson's method is ineffective when dealing with long lengths of tube because that method requires an exceedingly large suction compressor. Applicant's method solves the problem of impregnating long lengths of tubing by forming a window in the tube's impermeable skin, drawing the resin to the region of the window by a vacuum while squeezing the tube to force the resin to flow toward the evacuated region, sealing the window, and repeating the process at another window far-

ther downstream. Thus by iterating and reiterating that process, the resin is drawn along to impregnate the entire length of the tube.

It is submitted that applicant has taught an improvement upon Everson's method which makes feasible the impregnation of long tube lengths and that the grant of a patent on that improvement is merited.

Accordingly, reexamination of this application is requested.

18. Patent claim 2 covers the subject matter of original application claim 5, and reads as follows:

> 2. The method according to claim 1, further including the step of forming an initial air seal at the end of the flexible tube at which the mass of resin was introduced by closing off that end of the tube after introduction of the mass of resin and before vacuum is applied to the interior of tube to draw the resin toward the region of vacuum application.

19. Patent claim 3 covers the subject matter of original application claim 6, and reads as follows:

> 3. The method according to claim 1, wherein said outer layer of the flexible tube is defined by a felt sheet coated with a synthetic resinous material that forms said film, the method further including the steps of
>
> (i) sewing together adjacent edges of the felt sheet to form the tube, and
>
> (ii) covering the resultant seam with a sealing strip that is impervious to air.

20. With these explanations and clarifications to the Examiner, the application was then allowed. U.S. Patent No. 4,366,012 ('012 Patent), entitled "Impregnation Process," issued to Eric Wood on December 28, 1982. Insituform is the owner of the '012 patent. ITI is the exclusive licensee within the United States, and has granted a sublicense to INS for territory that includes the City of Houston. It is still in full force and effect, and for purposes of this proceeding its validity is established.

Background of Earlier Proceedings

21. In early 1989, after reading about KM's proprietary sewer rehabilitation technology in a trade magazine, Mr. Guilio Catallo, the president of CAT, contacted KM for the purpose of obtaining a license for that technology. In March 1989 he traveled to Europe to observe KM's process for impregnating and installing liners in underground sewer lines, and to negotiate a license from KM.

22. On March 17, 1989, Mr. Catallo signed a letter of intent with KM to license the technology. On March 21, he submitted a bid on behalf of CAT Contracting and Michigan Sewer to perform pipe rehabilitation services for the City of Houston, specifically, Wastewater Job Nos. 3907-12 and 3907-16, sometimes referred to as the "Sims Bayou Contracts." CAT/Michigan Sewer (a joint venture) submitted the low bid and was eventually awarded the contract.

23. During the bidding process, Mr. Catallo received a letter dated April 7, 1989 from Insituform's attorney, Mr. Harold James, notifying CAT and Michigan Sewer that if they practiced the process being utilized by KM, they would infringe U.S. Patents 4,009,063 ('063 patent)

and 4,786,345 ('345 patent). The letter did not mention the '012 patent, nor was Mr. Catallo notified of the '012 patent until this lawsuit was filed.

24. On February 2, 1990, Plaintiffs filed an original complaint against Defendants in the Eastern District of Michigan, alleging infringement not only of the '063 and '345 patents, but also of the '012 patent. In May 1990 the case was transferred to the Southern District of Texas. The Plaintiffs filed an amended complaint in this court, realleging infringement of the '063 and '012 patents, but dropping charges relating to the '345 patent. Defendants filed an answer, alleging that, among other things, the patents were not infringed.

25. In June 1991, after a two-week trial, a jury returned a verdict that included the finding that both patents were infringed. Defendants filed motions for new trial and judgement notwithstanding the verdict. In pertinent part, the Defendants argued that the evidence showed that Plaintiffs were legally estopped from construing claim 1 to cover Defendants' Multiple Cup Process ("Process l," discussed in greater detail below), either literally or by the doctrine of equivalents.

26. In August 1991 this Court partially granted Defendants' motions, ordering a judgment notwithstanding the verdict on the issue of literal infringement of both patents, and granting a new trial on the issue of infringement under the doctrine of equivalents. The issue of damages had previously been bifurcated from the issue of infringement by order of the Court dated March 5, 1991. Although the March 5, 1991 order also erroneously referred to the bifurcation of the defendants' counterclaim for antitrust violations, the Defendant's motion for leave to amend to add a claim for

antitrust violations was never granted, and has been subsequently denied by this Court.

27. In January 1995 Plaintiffs dismissed with prejudice their charges of infringement of the '063 patent, leaving as the only issue whether Defendants infringe the '012 patent under the doctrine of equivalents. In addition to the Multiple Cup Process (Process 1), the Plaintiffs are alleging that the Multiple Needle Process Process 2) also infringes the '012 patent. Process 2 was not accused of infringement in the original trial, nor had Process 2 been disclosed by the Defendants at the time of the first trial.

Defendants' Accused Impregnation Processes

28. Defendants have carried out in this country or, in the case of KM, have induced the carrying out of processes for the rehabilitation of pipelines using a lining formed primarily of an appropriate thickness of felt impregnated with a thermosetting resin, which lining when soft is inserted into the damaged pipe, urged out toward the pipe interior, and subjected to heat in order to set the resin. The strength of Defendants' linings, like that of plaintiffs' lining, depends upon the thickness of the lining and the substantially complete impregnation of the felt by the unset resin. Defendants have over the years varied the impregnation process that they employed, but in all of those processes the felt is in tubular form with an impermeable film on the outside, a mass of resin sufficient to impregnate a predetermined extensive length of the liner (sometimes the entire length of the liner) is introduced into the tube, an opening is made in the impermeable film at a predetermined distance from the resin, vacuum is drawn through that opening, the lining is caused to move through squeezing rollers

located upstream of the resin mass, and when that resin mass, because of the movement of the lining through the squeezing rollers, approaches the opening through which suction is being exerted, that is to say, the vicinity of the region of vacuum application, the vacuum source is removed from that opening, the opening is sealed, a new opening is provided in the impermeable layer downstream of the resin, vacuum is drawn through the new opening, the lining being progressively continuously moved and the process is repeated for whatever number of times are required for the given length of lining and the amount of resin introduced.

29. There are three variations in the impregnation process carried out by Defendants. In one, which Mr. Catallo testified at the first trial was carried out about 20% of the time, the vacuum was applied by means of a single vacuum cup which remained in place throughout the impregnation process.

30. In a second process described at the first trial and here called Process 1 by Defendants, a plurality of vacuum cups (usually four) were simultaneously applied to a corresponding plurality of openings along the length of the liner. When the resin front approaches the region of vacuum application (the leading cup), it is removed and that opening is sealed, the second cup is removed and the first cup is put in its place, the third cup is removed and the second cup is put in its place, and so on until finally the last cup is removed, a new opening is formed in the impermeable layer downstream of the last then-existing opening, and the last cup is placed over that new opening. The lining is moved continuously through the nip rollers as this goes on.

31. Since the first trial, Defendants have gone to a third process, here called Process 2 by Defendants, which modifies Process 1 in two respects. First, instead of using a vacuum cup, they use a tube (they call it a "needle") connected at one end to the vacuum pump with its other end penetrating the impermeable film and being exposed to the felt, vacuum being drawn through that tube. Second, instead of shifting all of the tubes when the first tube approaches the resin front, they leave tubes 2 and 3, etc. in place and when the first tube is removed and its hole sealed, that first tube is moved to a position downstream from the last tube, where it is caused to penetrate the lining and draw a vacuum.

32. In both of these multi-cup Processes 1 and 2, Defendants are removing the suction source (cup or tube) from the hole close to the resin front, sealing that hole, making a new opening downstream and applying the suction source (cup or tube) to that new hole, and continuing that procedure sequentially while the lining is continuously moving through the squeezing rollers and over the mass of introduced resin.

33. K-M also uses an impregnation process involving the sequential application of vacuum to the liner, which was demonstrated to Mr. Catallo when he visited Germany and before he commenced his activities complained of in this lawsuit. In that process an opening is formed relatively near the resin front and a vacuum cup is applied. When that opening approaches the resin front, a second opening is made downstream of the lining and a second vacuum cup is applied, the first vacuum cup is removed, the first opening is sealed, and the process is continued sequentially for as long as is appropriate.

The Function of the Vacuum

34. What the vacuum does in the impregnation process is ensure that there is as little air as possible in the felt at the resin front, where the resin is entering the felt. The presence of air elsewhere in the felt is of no direct significance. It is only the vacuum in the felt at the resin front which determines the degree to which impregnation of the felt by the resin occurs.

35. The felt before impregnation is quite dense, so that air flow through it is restricted. That is one reason why, when suction is exerted only from the far end of the liner, it takes many hours to produce an adequate degree of suction at the resin front, and that is why the suction process disclosed in the Everson and Rhys-Jones prior art references, while marginally practical when employed with relatively short and narrow linings, is totally impractical if employed with longer and wider linings such as are commonplace today.

36. When the suction source (cup or tube) approaches the resin front and is removed, exposing the opening through which suction had previously been drawn, air tends to enter the lining through that opening and reduce the degree of suction within the lining, and particularly at the resin front. However, it is only a matter of five second or less to remove the suction source and seal the opening, and during that time very little air enters the lining and reaches the resin front. Similarly, only a very few seconds is involved between making the second opening, through which air tends to enter, and covering that second opening with the suction source, and in practice only about 15-20 seconds is involved in the entire procedure of removing the section source, sealing the opening, making the new opening and apply-

ing the suction source to the new opening. During that time, the degree of vacuum at the resin front does decrease somewhat, but not to a material degree. In practice the impregnation process continues uninterrupted during that time, with the lining continuously moving forward at a constant speed and the resin continuously impregnating newly presented portions of the felt.

37. Hence, in the single-cup process disclosed in the '012 patent, while the act of sucking air from the liner is interrupted during the few seconds required to effectuate the shift in position of the suction cup, and the degree of suction at the resin front decreases as a result, there is always a sufficient degree of vacuum at the resin front to provide for effective substantially complete impregnation of the felt. The vacuum within the liner, and particularly the vacuum at the resin front, is not interrupted or discontinuous. It is variable, but to a degree which makes no difference insofar as substantially complete felt impregnation is concerned.

38. The claim of the patent calls for forming a window and disposing a cup over that window to create a vacuum. Although the scope of the claim is limited to a process which uses only one vacuum cup that results in a discontinuous vacuum, Insituform and its licensees sometimes use the single-cup process, but more often the multiple-cup process, because the multiple-cup process more rapidly achieves the desired vacuum at the resin front when relatively wide or thick liners are being impregnated. The reason wide or thick liners call for multiple cups is that with them the cross-sectional area of the felt exposed to the resin is quite large, making the obtaining of an adequate vacuum more difficult. The more suction cups that are working at any one time the

more rapidly is the requisite degree of vacuum achieved at the resin front. The shifting of cups in the multiple-cup process results in a lessening of the vacuum at the resin front, just as in the case of the single-cup process, but the difference in degree in either the single-cup or multiple-cup process is not material in the overall carrying out of the impregnation process.

39. The claim calls for "an outer layer formed by an impermeable film." The purpose and function of that outer layer is to keep the resin in the felt during the impregnation process. Defendants' processes involve the use of a plastic layer immediately outside the felt layer which is also impermeable during the impregnation process, and which keeps the resin in the felt during the impregnation process. The function of the impermeable layer is to keep the resin in the felt layer during impregnation. The impermeable plastic layer performs this function in the claim 1 method performed by the Plaintiff and in the Process 1 and 2 methods performed by the Defendant even though the Defendant has a very thin felt layer on top of their impermeable layer.

40. Defendant has presented evidence to attempt to demonstrate the substantiality of the differences between the methods that they use in Processes 1 and 2 and the Plaintiff's method in Claim 1 of the patent to avoid a finding of infringement under the doctrine of equivalents. Defendants describe the substantiality of the differences as follows:

Multiple Cup Process (Process 1)

41. The Multiple Cup Process (Process 1) was based on KM's process used in Europe. It involves a process whereby a quantity of curable resin is introduced inside one end (the upstream end) of an elongated hose-like

liner, which has felt as its outermost surface. A plastic layer is sandwiched between the outer felt layer and an inner felt layer. The liner is positioned along a tilted conveyer belt, causing the resin to flow downstream. Slits are formed 10-15 feet apart in the outer felt and plastic layer of the liner. Multiple vacuum cups (typically 4-6) are then positioned over the slits. A vacuum pump is connected to the cups by hoses. The cups apply vacuum simultaneously along the liner, to pull air from the inner felt layer, allowing the flowing resin to evenly soak or impregnate the inner felt.

42. Interruption of vacuum during the proem is avoided by using the multiple cups to draw a continuous vacuum beyond the isolated region closest to the resin. The continuous vacuum zone extends approximately 30-50 feet along the liner. When the cup closest to the resin is removed, the remaining cups positioned farther downstream continue to draw vacuum on the inner felt. The presence of those cups insures that a continuous uninterrupted vacuum is maintained.

Multiple Needle Process (Process 2)

43. The Multiple Needle Process (Process 2) was developed by CAT in 1991 to replace Process 1. In Process 2, multiple hollow needles (typically 4-6), are positioned approximately 10-15 feet apart along the liner. Those needles apply a continuous vacuum to the liner.

44. A quantity of curable resin is introduced inside one end (the upstream end) of the elongated hose-like liner. As in Process 1, the outermost surface of the hose-like liner is made of felt, and the liner is positioned along a tilted conveyer belt, causing the resin to flow downstream.

45. Each needle is used to puncture the liner, such that the needle tip is positioned in the inner felt. The needles are inserted so that they point horizontally in the direction of the resin. Each needle is anchored to the liner, and is connected to the vacuum pump by a hose. When the vacuum pump is activated, the needles draw a vacuum from the inner felt through the tip of the needle. The needles apply vacuum simultaneously along the liner, to pull air from the inner felt layer, allowing the flowing resin to evenly soak or impregnate the inner felt.

46. A continuous uninterrupted vacuum is maintained at all times on the inner felt. When the resin approaches the first needle, that needle is removed and the hole sealed. When that needle is removed, the remaining needles positioned farther downstream continue to draw vacuum on the inner felt. Interruption of vacuum is avoided, since the needles continue to draw a vacuum beyond the isolated region closest the resin. The continuous vacuum zone extends approximately 30-50 feet along the liner.

Conclusory Findings

47. The Court has considered the evidence of the substantiality of the differences between Plaintiff's patent Claim 1 and the processes used by the Defendants. Defendants' Processes 1 and 2 do not differ substantially from the process disclosed in the '012 patent. They correspond in every detail to claim 1 of the '012 patent, perform the same function (producing effective vacuum at the resin front) by the same means (sequential application of vacuum to the interior of the liner at points along the liner as the liner is moved) and achieve the same result (uniform impregnation of the felt by the resin).

48. Rather than using one cup with a discontinuous vacuum, Process 1 uses multiple cups with a continuous vacuum. The Court has evaluated the substantiality of the differences between Plaintiffs Patent Claim 1 and Process 1. While the addition of more cups prevents a finding of literal infringement, it fails, in this case, to prevent a finding of infringement under the doctrine of equivalents. It is not reasonable for the Defendants to believe that the enhancement of the process by the use of multiple cups results in a substantial difference between Process 1 and the process in Patent Claim 1. Neither is it reasonable for Defendants to have concluded that Inliner relinquished coverage of processes using multiple cups. Defendants' Process 1 is the full equivalent of the process described in claim 1 of the '012 patent. It does the same thing by the same means to accomplish the same result.

49. Rather than using one cup with a discontinuous vacuum, Process 2 uses multiple needles with a continuous vacuum. The Court has also evaluated the substantiality of the differences between Plaintiffs Patent Claim 1 and Process 2. While the substitution of needles for cups and the addition of multiple needles prevents a finding of literal infringement, it fails, in this case, to prevent a finding of infringement under the doctrine of equivalents. Again, while the needles result in some enhancement in performance, it is not reasonable for the Defendants to conclude that this resulted in a substantial difference between its process and that of the Plaintiff or that Plaintiff relinquished any rights to this type of process. Defendants' Process 2 is the full equivalent of the process described in claim 1 of the '012 patent. It does the same thing by the same means to accomplish the same result. The purpose, function and

result of the cup, as claim 1 points out in section (3), is to "prevent(s) ingress of air into the interior of the tube while the tube is being evacuated", which is precisely the purpose, function and result of the needle. Both the cup and the needle are, as claim 1 states, "connected by a flexible hose to a vacuum source", both are the means provided for the application of vacuum, they both do the same thing (suck a vacuum) by the same means (being connected to a vacuum source) to achieve the same result (produce a satisfactory vacuum at the resin front).

50. The vacuum at the resin front when carrying out the multiple-cup Process 1 or multiple-needle Process 2 may be somewhat more efficient, during the time that the vacuum cups are being shifted, however, modification by the addition of multiple cups to the process to create this additional efficiency does not avoid infringement by equivalency because the multiple cups perform the same function in the same way to achieve the same results.

51. Neither does the substitution of the needle for the cup avoid infringement by equivalency because the mere modification of this feature does not avoid the fact that the basic features of Claim 1 of the patent have been adopted. This new feature performs substantially the same function, in substantially the same way, to achieve substantially the same result. This apparatus distinction is irrelevant in the determination of whether the Defendants' processes infringe under the doctrine of equivalents.

52. There is nothing in the file history of the '012 patent or the prior art which prevents claim 1 from covering Defendants' processes. The patentee originally claimed, in claim 1, all types of vacuum application, and

in claim 4 he originally claimed the sequential application of vacuum. The prior art cited by the Examiner did not show that sequential vacuum application, and by amending the claims, the patentee abandoned protection broad enough to include all types of vacuum application but properly retained claims to sequential vacuum application, which is precisely what Defendants do in all of their processes.

53. Because the claims in patent speak to the use of one cup, they result in a discontinuous vacuum. The use of the multiple cup and multiple needle processes result in a continuous vacuum which enhances the degree of vacuum achieved at the resin front. While this enhancement results in an improvement of the process, there is nonetheless an insubstantial difference between Patent Claim 1 and Processes 1 and 2.

CONCLUSIONS OF LAW

1. The Constitution of the United States authorizes Congress to enact laws to promote the progress of science and useful arts by granting inventors exclusive rights to their inventions for limited periods. These grants, known as "patents", serve the advancement of science because, after the grant period of seventeen (17) years expires, the invention is given to the public for free use by all. As part of the Department of Commerce, the United States Patent and Trademark Office was set up for the purpose of granting patents. It is made up of individuals with technical and legal training whose job it is to carefully review all applications of patents and to issue the patents when appropriate. Because patent examiners have technical and legal expertise, their decisions as to patentability are given great weight. Congress has passed a statute which requires courts to

respect the decisions of these experts by resolving doubts as to whether granted patents are valid in favor of the inventor. This is known as the presumption of validity". United States Constitution, Article 1, Section 8, Clause 8; Title 35 United States Code.

2. A patent has one or more claims. The claims measure the invention. Each claim defines a separate, independent invention. *Continental Paper Bag Co. v. Eastern Paper Bag Co.*, 210 U.S. 405, 419, 52 L. Ed. 1112, 28 S. Ct. 748 (1908); *Ballantyne inst. & Electronics, Inc. v. Wagner*, 345 F.2d, 671 (6th Cir. 1965).

3. Because the patent is presumed valid, to exercise the rights granted by the '012 patent, what the patent owner must do is prove that his patented invention is being used without his permission. This is called infringement. Plaintiff must prove infringement by a preponderance of the evidence. Once that is proved, the patent owner is then entitled to prevent further unauthorized use of the invention by means of an injunction, and to compensation for past unauthorized use. 35 U.S.C. 271, 283, 284; *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1054 (Fed. Cir. 1988) *cert. denied* 57 U.S.L.W 3281 (1988).

Infringement Generally

4. Whoever without authority makes, uses, or sells any patented invention within the United States during the term of the patent therefor, infringes the patent. 35 U.S.C. § 271. The party who asserts infringement has the burden of proving infringement by a preponderance of the evidence. *Braun, Inc. v. Dynamics Corp.*, 975 F.2d 815, 819 (Fed. Cir. 1992).

5. Infringement can be proved in either one of two ways. One way is by showing literal infringement. If Defendant's method falls clearly within the language of the claims, literal infringement is made out and that is the end of it. *Graver Tank & Mfg. Co. v. Linde Air Products, Co.*, 339 U.S. 605, 607, 94 L. Ed. 1097, 70 S. Ct. 854 (1950).

6. One may avoid literal infringement by using the essence of an invention, but not duplicating it exactly. To overcome this problem, and preserve to inventors what is rightfully theirs, it is well settled that even if there is no literal infringement, one can infringe if one employs a step or steps which are equivalent to those steps in the patent claim which are not met exactly. This rule, called the "doctrine of equivalents", prevents infringers from beating the system by making insignificant changes in the process to avoid literal infringement. *Graver Tank &. Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 607, 94 L. Ed. 1097, 70 S. Ct. 854 (1950); *Coming Glass Works v. Sumitomo Elec. USA, Inc.*, 68 F.2d 1251, 1258 (Fed. Cir. 1989). *Laitram Corp. v. Cambridge Wire Cloth Co.*, 863 F.2d 855, 856-7 (1988).

7. This case involves process claims. Equivalency is made out if the steps of Defendants' accused processes are either the same as the Plaintiff's claim (literal infringement) or the Defendants' processes perform substantially the same function as the corresponding step set forth in the claim in substantially the same way to obtain substantially the same result. *Pennwalt Corp. v. Durand-Wayland Inc.*, 833 F.2d 931, 934 (Fed. Cir. 1987). This is known as infringement by equivalents. Something is "equivalent" if it does not substantially change the way in which the function of the claimed

invention is performed. *Pennwalt*, at p. 935. A process may be found to be equivalent if after considering the substantiality of the claimed differences in the new process, the fact finder can conclude that the new process represents an insubstantial change. *Hilton Davis Chemical Co. v. Warner-Jenkinson Co.*, No. 93-1088, 1995 U.S. App. LEXIS 21069 (Fed. Cir. August 8, 1995) (per curiam).

8. The issue of equivalency is a question of fact. *Durango Associates Inc. v. Reflange Inc.*, 843 F.2d 1349, 1357 (Fed. Cir. 1988); *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1057 (Fed. Cir. 1988); *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d 1100, 1110 (Fed. Cir. 1987).

9. In accordance with equitable principles, for infringement to exist under the doctrine of equivalents an accused method must perform substantially the same function, in substantially the same way, to achieve substantially the same result as the invention defined by the claims. *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 608, 94 L.Ed. 1097 (1950).

10. To properly apply the *Graver Tank* "function-way-result" test, the function, way and result of each accused process (Process I and Process 2) are compared to the function, way and result of the method claimed in the '012 patent. *Malta v. Schulmerich Carillons, inc.*, 952 F.2d 1320, 1327 (Fed. Cir. 199 1); *Lear Siegler, Inc., v. Sealy Mattress Co. of Mich.*, 873 F.2d 1422, 1425-26 (Fed. Cir. 1989).

11. If the evidence shows that even one of these conditions is not satisfied, there can be no infringement by equivalents. *London,* 946 F.2d at 1539; *Johnston v.*

IVAC Corp., 885 F.2d 1574, 1581 (Fed. Cir. 1989); *Lear Seigler*, 873 F.2d at 1581.

12. Each of the three components (function-way-result) must be separately met. *Universal Gym Equip., Inc. v. ERWA Exercise Equip. Ltd.*, 827 F.2d 1542, 1548 (Fed. Cir. 1987). Defendants' Process 1 and Process 2 perform substantially the same function and achieve substantially the same results in substantially the same way as the method claimed in the '012 patent.

13. The doctrine of equivalents is subservient to the doctrine of prosecution history estoppel. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 939 F.2d 1540, 1544 (Fed. Cir.), *reh'g denied*, (1991). Prosecution history estoppel limits the doctrine of equivalents. *Charles Greiner*, 962 F.2d at 1036. Prosecution history estoppel is an equitable tool for determining the permissible scope of patent claims. *Mannesmann DeMag Corp v. Engineered Metal Products Co.*, 793 F.2d 1279, 1284-85 (Fed. Cir. 1986).

14. Although the prior art also limits equivalents, prosecution history estoppel and the prior art are separate and distinct concepts. The limits on equivalency imposed by prosecution history estoppel can be, and frequently are, broader than those imposed by the prior art. *Haynes Intern., Inc. v. Jessup Steel Co.*, 8 F.3d 1573, 1579 (Fed. Cir. 1993), *modified on reh'g*, 15 F.3d 1275 (Fed. Cir. 1994). In this case, the issue is whether prosecution history estoppel limits the doctrine of equivalents.

15. Prosecution history estoppel limits a patentee's reliance on the doctrine of equivalents by preventing him from contending later in an infringement action that his claims should be interpreted as if limitations

added by amendment were not present. *Jonsson v. Stanley Works*, 903 F.2d 812, 821 (Fed. Cir. 1990).

16. Under the doctrine of prosecution history estoppel, where a patent applicant cancels a claim in the Patent Office to distinguish his invention from prior art, and replaces that claim with another claim, the patent owner is deemed to have surrendered the subject matter covered by the original claim, and cannot recapture that subject matter through the doctrine of equivalents. *Haynes*, 8 F.3d at 1577-78; *Wang Laboratories, Inc. v. Toshiba Corp.*, 993 F.2d 858, 868 (Fed. Cir. 1993); *Charles Greiner,* 962 F.2d at 1036; *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 681 (Fed. Cir. 1988). There is no surrendered subject matter under the facts of this case.

17. The legal standard for determining what subject matter was surrendered is an objective one, measured from the vantage point of what a competitor was reasonably entitled to conclude, from the prosecution history, that the application gave up to procure issuance of the patent. *Haynes*, 8 F.3d at 1577-78.

18. Whether or not estoppel exists is a question of law, *Wang Laboratories Inc. v. Toshiba Corp.*, 993 F.2d 858, 867 (Fed. Cir. 1993), and is determined in the context of the entire prosecution history of the patent — the prior art, the Examiner's rulings and the patentee's arguments. In *Wang*, 993 F.2d at 858, when the original claims (for a circuit board with memory chips) were rejected as being unpatentable in view of prior art, the applicant cancelled those claims, replacing them with new claims that required the memory chips to be "mounted in a single row." *Id.* at 867. Those claims eventually issued as part of the patent. The Defendants'

accused devices ("lateral memory modules") had two rows of memory chips and therefore lacked the very limitation added by amendment (memory chips "mounted in a single row"). The district court permitted the jury to find infringement by equivalents. The Federal Circuit reversed. The court held that "prosecution history estoppel should have been applied to reach the conclusion that the accused lateral memory modules were surrendered during prosecution and therefore do not infringe under the doctrine of equivalents." *Id.* at 868. Even though the specific accused lateral memory modules were not cited prior art during prosecution, the Federal Circuit held that coverage of those devices was surrendered. *Id.* at 867-68.

19. The facts of the present case are distinguishable from the facts in *Wang*. In *Wang*, estoppel was found because in that case the patentee, in arguing to the Examiner, stressed the significance of mounting chips "only in a single row" and that limitation was added to the claims. There estoppel was found excluding multiple row mounting as antithetical to the arguments presented to the Examiner. Similarly in *Charles Greiner & Co. Inc. v. Marri-Med Mfg.* Inc., 962 F.2d 1031 (Fed. Cir. 1992), the applicant during prosecution of the patent added to the claims the recitation that certain elements were located "only" at a particular location. Since in the accused device there was a different location, estoppel was found. There is nothing corresponding to that in this case.

20. When originally presented but abandoned claims contained limitations in dispute with respect to the applicability of the doctrine of equivalents, as is the case here, that is an important factor indicating the lack of applicability of the estoppel doctrine to those limita-

tions. *Insta-Foam Products Inc. v. Universal Foam Systems Inc.*, 906 F.2d 698, 703 (Fed. Cir. 1990):

> For the reason that the allowed claim contains the same limitation regarding the connection between the trigger and plunger means as did the abandoned claim, the patent applicant did not disclaim anything relating to the manner by which the plunger and trigger are connected.

See also LaBounry Mfg., Inc. v. U.S. International Trade Commission, op. cit. *supra.*

21. In view of the facts in this case the doctrine of prosecution history estoppel is not available to Defendants.

22. Defendants' single-cup process as described in Finding of Fact 29 does not infringe claim 1 of the '012 patent, under the doctrine of equivalents.

23. Defendants' Process 1 infringes claim 1 of the '012 patent under the doctrine of equivalents.

24. Defendants' Process 2 infringes claim 1 of the '012 patent under the doctrine of equivalents.

25. Plaintiffs are entitled to an injunction against the carrying out by the Defendants of any of the infringing processes here dealt with and from carrying out any other impregnation process which infringes those claims.

26. The Court's previous injunction entered on December 1, 1995, Instrument No. 253, will remain in force together with the subsequently issued order addressing enforcement of that injunction, Instrument No. 305.

Signed this 27th day of December, 1996.

/s/ Vanessa D. Gilmore
VANESSA D. GILMORE
UNITED STATES DISTRICT
JUDGE

APPENDIX H

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

INSITUFORM TECHNOLOGIES, INC., INSITUFORM (NETHERLANDS) B.V., AND INSITUFORM GULF SOUTH, INC.,
Plaintiffs,
v.
CAT CONTRACTING, INC., MICHIGAN SEWER CONSTRUCTION COMPANY, KANAL SANIERUNG HANS MULLER GmbH & CO. KG, AND INLINER U.S.A.,
Defendants.

CIVIL ACTION NO. H-90-1690

SECOND AMENDED FINDINGS OF FACT AND CONCLUSIONS OF LAW

FINDINGS OF FACT

Procedural History

1. In February 1990, Defendants were sued for infringement of U.S. Patents 4,009,063 of February 22, 1977 and 4,336,012 of December 18, 1982, both the inventions of Eric Wood and both now owned by Insituform Technologies, Inc.

2. In 1991, there was a jury trial of the issues of infringement and validity of the '063 and '012 patents. The jury returned a verdict finding validity and infringement as to both patents.

3. Defendants moved for judgment notwithstanding the verdict or new trials on to all issues. Judge Hughes granted Defendants' JNOV motions with respect to literal infringement of both patents, ordered a new trial with respect to the issue of infringement by the doctrine of equivalents of both patents, and denied Defendants' motion in all other respects.

4. Trial of the issues of recoverable damages as against each defendant has been bifurcated, and is not here involved, nor was it involved in the 1991 trial.

5. The '063 patent expired February 22, 1984. The parties have stipulated that it is no longer involved in this lawsuit.

Parties and Jurisdiction

6. Plaintiff Insituform (Netherlands) B.V. ("Insituform") is a corporation of the Netherlands, with a principal place of business at Herengracht 552, Amsterdam 1001, Netherlands. Insituform Technologies, Inc. ("ITI") is a Delaware corporation, having a principal place of business at 3315 Democrat Road, Memphis, Tennessee 38118. Insituform Gulf South, Inc. ("INS") is a Texas corporation, having a principal place of business at 131 North Richey, Pasadena, Texas 77506.

7. Defendant Cat Contracting, Inc. ("CAT") is a Michigan corporation, having its principal place of business at 2022 FM 528, Alvin, Texas, 77518. Michigan Sewer Construction Company ("Michigan Sewer") is a Michigan corporation, having a principal place of business at 21720 West Eight Mile Road, Southfield, Michigan 48075. Kanal Mueller Gruppe International (KMG) is a corporation of the Federal Republic of Germany, having

a place of business at 4938 Schieder-Schwalengerg, Federal Republic of Germany. Kanal Sanierung Hans Mueller GmbH & CO KG ("KM"), is a licensee of KMG for the country of Germany. Inliner U.S.A. ("Inliner") is a corporation of the State of Delaware, having a principal place of business in Houston, Texas.

8. This Court has jurisdiction over the parties and the subject matter of this case 28 U.S.C. §§ 1331, 1338(a), 2201 and 2202. Venue is proper in the Southern District of Texas. 28 U.S.C. §§ 1391 and 1400.

Background

9. Sewer pipes and the linings of sewer pipes are subjected to stresses. That is particularly true in the case of underground sewer pipes. It is necessary that the lining be capable of withstanding those stresses for an appreciable period of time, as long as 50 years.

10. To accommodate those requirements, Eric Wood, through Insituform, pioneered a process in which the soft liners are made up of a relatively thick layer of felt which is impregnated with a thermosetting resin. (A thermosetting resin is a resin which, when subjected to heat, will become hard but which, before the heat is applied, is soft.) After the felt liner has been put in place within the pipe to be repaired and has been pressed outwardly so as to conform to the pipe, the resin is heated, by flowing hot water through the lining, causing the resin to set. The strength of the lining thus produced is primarily dependent upon the set resin which has impregnated the lining. It is essential, if the lining is to have the desired strength and longevity, that the impregnation of the felt by the resin be substantially uniform.

11. Soft linings of the type in question are inserted in lengths that are usually many hundreds of feet long. When such linings are impregnated with resin they weigh many tons. Some jobs have involved the use of as much of 100 tons of resin. The felt that is used is quite dense and it is difficult to get the resin into the felt and ensure that the felt is substantially fully impregnated by the resin. A way needed to be found to achieve a substantially complete impregnation of felt linings of the size involved with the understanding that the presence of any substantial amount of air in the liner after impregnation would be unacceptable.

12. The major impediment to uniform impregnation of the felt by the resin is the presence of air in the felt. The resin must displace the air, and do so substantially completely, if the felt is to be uniformly and satisfactorily impregnated.

13. Early on in the development of this technology, it was learned that the impregnation process would be greatly facilitated if air were to be sucked from the interior of the felt tube [sic] during the impregnation process, a method was utilized where a vacuum pump was connected at the far end for the lining and air was sucked out of the lining from that far end until a satisfactory vacuum was created in the lining. That is what is shown in Everson patent 4,182,262 of 1980 and in the British Rhys-Jones article of 1975. It took a very appreciable length of time before sucking air from the free end of the liner produced a satisfactory vacuum at the point in the liner where the resin was beginning to enter the felt (the "resin front"), and impregnation could not start until that had been accomplished. The lengths of the liners used at the time of Everson and Rhys-Jones were relatively short, however, so the length of time

involved was marginally acceptable. As the length of the liners increased, the time needed to produce the desired vacuum at the resin front increased as the square of the distance involved — a liner twice as long would need four times as much time, and a liner four times as long would need sixteen times as much time. It is to this problem that the patent in suit, 4,366,012 of December 28, 1982, is directed.

The Patent In Suit

14. When Mr. Wood filed the patent application, original claim 1 called broadly for the application of the vacuum while the impregnation process is taking place. Original claims 2 and 3 added to claim 1 that the resin was introduced into one end of the tube and fed down the tube by means of nip rollers and the vacuum was applied to the interior of the tube downstream of the resin mass. Original claim 4 added to the above that the vacuum was applied through a window formed in the wall of the tube by means of a cup connected to a source of vacuum, the cup moving with the tube during its movement relative to the nip rollers, and the cup being removed and applied to a position spaced downstream from the previous window, the previous window being sealed by means of a patch or the like, whereby the process is repeated for respective lengths of the tube until the entire tube length has been impregnated.

15. The Patent Examiner, in his first action on the merits, rejected all of those claims on the basis of the Everson patent, the Examiner saying: "The claimed process does not appear to differ in any unobvious aspect from that of the reference."

16. In response, by amendment dated April 6, 1982, applicant cancelled the original claims and added the

claims that appear in the patent. Patent claim 1 reads as follows:

> a. A method of impregnating with a curable resin an inner layer of resin absorbent material disposed in an elongate flexible tube having an outer layer formed by an impermeable film, the method comprising the steps of
>
> > (1) introducing into one end of the elongate tube a mass of the curable resin sufficient to impregnate the entire resin absorbent inner layer of the tube,
> >
> > (2) forming a window in the impermeable outer layer of the tube at a distance from said one end of the tube,
> >
> > (3) drawing through the window a vacuum in the interior of the tube downstream of said one end by disposing over the window a cup connected by a flexible hose to a vacuum source which cup prevents ingress of air into the interior of the tube while the tube is being evacuated, the outer layer of the tube being substantially impermeable to air,
> >
> > (4) beginning at or near the end at which the curable resin mass was introduced, passing the tube between squeezing members which force the resin to flow towards the region of vacuum application as the tube progresses through the squeezing members,
> >
> > (5) when the resin reaches the vicinity of the region of vacuum application, removing the cup and sealing the window,

(6) providing another window in the impermeable layer of the tube downstream of the previously formed window,

(7) drawing through the new window a vacuum in the interior of the tube while progressively moving the tube through the squeezing members to force the resin to flow toward the new region of vacuum application, and

(8) repeating steps 5, 6, and 7, where necessary to impregnate the entire resin absorbent inner layer of the flexible tube.

17. Applicant explained the similarity of the new claim to the original application claim 4 to the Examiner as follows: "(Application) Claim 10 (ultimately patent claim 1) incorporates the substance of cancelled claims 1, 2, 3 and 4." Applicant's total argument to the Examiner as to the patentability of that claim was as follows:

> The principal reference relied on in the rejection of claims 1 to 6 is the patent to Everson (U.S. 4,182,262). Everson's method is ineffective when dealing with long lengths of tube because that method requires an exceedingly large suction compressor. Applicant's method solves the problem of impregnating long lengths of tubing by forming a window in the tube's impermeable skin, drawing the resin to the region of the window by a vacuum while squeezing the tube to force the resin to flow toward the evacuated region, sealing the window, and repeating the process at another window farther downstream. Thus by iterating and reiterating that process, the resin is drawn along to impregnate the entire length of the tube.

> It is submitted that applicant has taught an improvement upon Everson's method which makes feasible the impregnation of long tube lengths and that the grant of a patent on that improvement is merited.

Accordingly, reexamination of this application is requested.

18. Patent claim 2 covers the subject matter of original application claim 5, and reads as follows:

> 2. The method according to claim 1, further including the step of forming an initial air seal at the end of the flexible tube at which the mass of resin was introduced by closing off that end of the tube after introduction of the mass of resin and before vacuum is applied to the interior of tube to draw the resin toward the region of vacuum application.

19. Patent claim 3 covers the subject matter of original application claim 6, and reads as follows:

> 3. The method according to claim 1, wherein said outer layer of the flexible tube is defined by a felt sheet coated with a synthetic resinous material that forms said film, the method further including the steps of
>
> (i) sewing together adjacent edges of the felt sheet to form the tube, and
>
> (ii) covering the resultant seam with a sealing strip that is impervious to air.

20. With these explanations and clarifications to the Examiner, the application was then allowed. U.S. Patent No. 4,366,012 ('012 Patent), entitled "Impregna-

tion Process," issued to Eric Wood on December 28, 1982. Insituform is the owner of the '012 patent. ITI is the exclusive licensee within the United States, and has granted a sublicense to INS for territory that includes the City of Houston. It is still in full force and effect, and for purposes of this proceeding its validity is established.

Background of Earlier Proceeding

21. In early 1989, after reading about KM's proprietary sewer rehabilitation technology in a trade magazine, Mr. Guilio Catallo, the president of CAT, contacted KM for the purpose of obtaining a license for that technology. In March 1989 he traveled to Europe to observe KM's process for impregnating and installing liners in underground sewer lines, and to negotiate a license from KM.

22. On March 17, 1989, Mr. Catallo signed a letter of intent with KM to license the technology. On March 21, he submitted a bid on behalf of CAT Contracting and Michigan Sewer to perform pipe rehabilitation services for the City of Houston, specifically, Wastewater Job Nos. 3907-12 and 3907-16, sometimes referred to as the "Sims Bayou Contracts." CAT/Michigan Sewer (a joint venture) submitted the low bid and was eventually awarded the contract.

23. During the bidding process, Mr. Catallo received a letter dated April 7, 1989 from Insituform's attorney, Mr. Harold James, notifying CAT and Michigan Sewer that if they practiced the process being utilized by KM, they would infringe U.S. Patents 4,009,063 ('063 patent) and 4,786,345 (345 patent). The letter did not mention the '012 patent, nor was Mr. Catallo notified of the '012 patent until this lawsuit was filed.

24. On February 2, 1990, Plaintiffs filed an original complaint against Defendants in the Eastern District of Michigan, alleging infringement not only of the '063 and '345 patents, but also of the '012 patent. In May 1990 the case was transferred to the Southern District of Texas. The Plaintiffs filed an amended complaint in this court, realleging infringement of the '063 and '012 patents, but dropping charges relating to the '345 patent. Defendants filed an answer, alleging that, among other things, the patents were not infringed.

25. In June 1991, after a two-week trial, a jury returned a verdict that included the finding that both patents were infringed. Defendants filed motions for new trial and judgement notwithstanding the verdict. In pertinent part, the Defendants argued that the evidence showed that Plaintiffs were legally estopped from construing claim 1 to cover Defendants' Multiple Cup Process ("Process 1," discussed in greater detail below), either literally or by the doctrine of equivalents.

26. In August 1991 this Court partially granted Defendants' motions, ordering a judgment notwithstanding the verdict on the issue of literal infringement of both patents, and granting a new trial on the issue of infringement under the doctrine of equivalents. The issue of damages had previously been bifurcated from the issue of infringement by order of the Court dated March 5, 1991. Although the March 5, 1991 order also erroneously referred to the bifurcation of the defendants' counterclaim for antitrust violations, the Defendant's motion for leave to amend to add a claim for antitrust violations was never granted, and has been subsequently denied by this Court.

27. In January 1995 Plaintiffs dismissed with prejudice their charges of infringement of the '063 patent,

leaving as the only issue whether Defendants infringe the '012 patent under the doctrine of equivalents. In addition to the Multiple Cup Process (Process 1), the Plaintiffs are alleging that the Multiple Needle Process (Process 2) also infringes the '012 patent. Process 2 was not accused of infringement in the original trial, nor had Process 2 been disclosed by the Defendants at the time of the first trial.

Defendants' Accused Impregnation Processes

28. Defendants have carried out in this country or, in the case of KM, have induced the carrying out of processes for the rehabilitation of pipelines using a lining formed primarily of an appropriate thickness of felt impregnated with a thermosetting resin, which lining when soft is inserted into the damaged pipe, urged out toward the pipe interior, and subjected to heat in order to set the resin. The strength of Defendants' linings, like that of plaintiffs' lining, depends upon the thickness of the lining and the substantially complete impregnation of the felt by the unset resin. Defendants have over the years varied the impregnation process that they employed, but in all of those processes the felt is in tubular form with an impermeable film on the outside, a mass of resin sufficient to impregnate a predetermined extensive length of the liner (sometimes the entire length of the liner) is introduced into the tube, an opening is made in the impermeable film at a predetermined distance from the resin, vacuum is drawn through that opening, the lining is caused to move through squeezing rollers located upstream of the resin mass, and when that resin mass, because of the movement of the lining through the squeezing rollers, approaches the opening through which suction is being exerted, that is to say, the vicinity of the region of vacuum application, the vacuum source is

removed from that opening, the opening is sealed, a new opening is provided in the impermeable layer downstream of the resin, vacuum is drawn through the new opening, the lining being progressively continuously moved and the process is repeated for whatever number of times are required for the given length of lining and the amount of resin introduced.

29. There are three variations in the impregnation process carried out by Defendants. In one, which Mr. Catallo testified at the first trial was carried out about 20% of the time, the vacuum was applied by means of a single vacuum cup which remained in place throughout the impregnation process.

30. In a second process described at the first trial and here called Process I by Defendants, a plurality of vacuum cups (usually four) were simultaneously applied to a corresponding plurality of openings along the length of the liner. When the resin front approaches the region of vacuum application (the leading cup), it is removed and that opening is sealed, the second cup is removed and the first cup is put in its place, the third cup is removed and the second cup is put in its place, and so on until finally the last cup is removed, a new opening is formed in the impermeable layer downstream of the last then-existing opening, and the last cup is placed over that new opening. The lining is moved continuously through the nip rollers as this goes on.

31. Since the first trial, Defendants have gone to a third process, here called Process 2 by Defendants, which modifies Process 1 in two respects. First, instead of using a vacuum cup, they use a tube (they call it a "needle") connected at one end to the vacuum pump with its other end penetrating the impermeable film and

being exposed to the felt, vacuum being drawn through that tube. Second, instead of shifting all of the tubes when the first tube approaches the resin front, they leave tubes 2 and 3, etc. in place and when the first tube is removed and its hole sealed, that first tube is moved to a position downstream from the last tube, where it is caused to penetrate the lining and draw a vacuum.

32. In both of these multi-cup Processes I and 2, Defendants are removing the suction source (cup or tube) from the hole close to the resin front, sealing that hole, making a new opening downstream and applying the suction source (cup or tube) to that new hole, and continuing that procedure sequentially while the lining is continuously moving through the squeezing rollers and over the mass of introduced resin.

33. K-M also uses an impregnation process involving the sequential application of vacuum to the liner, which was demonstrated to Mr. Catallo when he visited Germany and before he commenced his activities complained of in this lawsuit. In that process an opening is formed relatively near the resin front and a vacuum cup is applied. When that opening approaches the resin front, a second opening is made downstream of the lining and a second vacuum cup is applied, the first vacuum cup is removed, the first opening is sealed, and the process is continued sequentially for as long as is appropriate.

The Function of the Vacuum

34. What the vacuum does in the impregnation process is ensure that there is as little air as possible in the felt at the resin front, where the resin is entering the felt. The presence of air elsewhere in the felt is of no direct significance. It is only the vacuum in the felt at

the resin front which determines the degree to which impregnation of the felt by the resin occurs.

35. The felt before impregnation is quite dense, so that air flow through it is restricted. That is one reason why, when suction is exerted only from the far end of the liner, it takes many hours to produce an adequate degree of suction at the resin front, and that is why the suction process disclosed in the Everson and Rhys-Jones prior art references, while marginally practical when employed with relatively short and narrow linings, is totally impractical if employed with longer and wider linings such as are commonplace today.

36. When the suction source (cup or tube) approaches the resin front and is removed, exposing the opening through which suction had previously been drawn, air tends to enter the lining through that opening and reduce the degree of suction within the lining, and particularly at the resin front. However, it is only a matter of five second or less to remove the suction source and seal the opening, and during that time very little air enters the lining and reaches the resin front. Similarly, only a very few seconds is involved between making the second opening, through which air tends to enter, and covering that second opening with the suction source, and in practice only about 15-20 seconds is involved in the entire procedure of removing the section source, sealing the opening, making the new opening and applying the suction source to the new opening. During that time, the degree of vacuum at the resin front does decrease somewhat, but not to a material degree. In practice the impregnation process continues uninterrupted during that time, with the lining continuously moving forward at a constant speed and the resin continuously impregnating newly presented portions of the felt.

37. Hence, in the single-cup process disclosed in the '012 patent, while the act of sucking air from the liner is interrupted during the few seconds required to effectuate the shift in position of the suction cup, and the degree of suction at the resin front decreases as a result, there is always a sufficient degree of vacuum at the resin front to provide for effective substantially complete impregnation of the felt. The vacuum within the liner, and particularly the vacuum at the resin front, is not interrupted or discontinuous. It is variable, but to a degree which makes no difference insofar as substantially complete felt impregnation is concerned.

38. The claim of the patent calls for forming a window and disposing a cup over that window to create a vacuum. Nowhere in the claim is the licensee restricted to the use of one cup. Insituform and its licensees have used multiple suction cups spaced along the length of the liner for many years prior to Defendants' existence. Insituform licensees sometimes use the single-cup process, but more often the multiple-cup process, because the multiple-cup process more rapidly achieves the desired vacuum at the resin front when relatively wide or thick liners are being impregnated. The reason wide or thick liners call for multiple cups is that with them the cross-sectional area of the felt exposed to the resin is quite large, making the obtaining of an adequate vacuum more difficult. The more suction cups that are working at any one time the more rapidly is the requisite degree of vacuum achieved at the resin front. The shifting of cups in the multiple-cup process results in a lessening of the vacuum at the resin front, just as in the case of the single-cup process, but the difference in degree in either the single-cup or multiple-cup process is not material in the overall carrying out of the impregnation process.

39. The claim calls for "an outer layer formed by an impermeable film." The purpose and function of that outer layer is to keep the resin in the felt during the impregnation process. Defendants' processes involve the use of a plastic layer immediately outside the felt layer which is also impermeable during the impregnation process, and which keeps the resin in the felt during the impregnation process. The function of the impermeable layer is to keep the resin in the felt layer during impregnation. The plastic layer performs this function in the claim 1 method performed by the Plaintiff and in the Process 1 and 2 methods performed by the Defendant even though the Defendant has a very thin felt layer on top of the impermeable layer.

40. Defendant has presented evidence to attempt to demonstrate the substantiality of the differences between the methods that they use in Processes 1 and 2 and the Plaintiff's method in Claim 1 of the patent to avoid a finding of infringement under the doctrine of equivalents. Defendants describe the substantiality of the differences as follows:

Multiple Cup Process (Process 1)

41. The Multiple Cup Process (Process 1) was based on KM's process used in Europe. It involves a process whereby a quantity of curable resin is introduced inside one end (the upstream end) of an elongated hose-like liner, which has felt as its outermost surface. A plastic layer is sandwiched between the outer felt layer and an inner felt layer. The liner is positioned along a tilted conveyer belt, causing the resin to flow downstream. Slits are formed 10-15 feet apart in the outer felt and plastic layer of the liner. Multiple vacuum cups (typically 4-6) are then positioned over the slits. A vacuum

pump is connected to the cups by hoses. The cups apply vacuum simultaneously along the liner, to pull air from the inner felt layer, allowing the flowing resin to evenly soak or impregnate the inner felt.

42. Interruption of vacuum during the process is avoided by using the multiple cups to draw a continuous vacuum beyond the isolated region closest to the resin. The continuous vacuum zone extends approximately 30-50 feet along the liner. When the cup closest to the resin is removed, the remaining cups positioned farther downstream continue to draw vacuum on the inner felt. The presence of those cups insures that a continuous uninterrupted vacuum is maintained.

Multiple Needle Process (Process 2)

43. The Multiple Needle Process (Process 2) was developed by CAT in 1991 to replace Process 1. In Process 2, multiple hollow needles (typically 4-6), are positioned approximately 10-15 feet apart along the liner. Those needles apply a continuous vacuum to the liner.

44. A quantity of curable resin is introduced inside one end (the upstream end) of the elongated hose-like liner. As in Process 1, the outermost surface of the hose-like liner is made of felt, and the liner is positioned along a tilted conveyer belt, causing the resin to flow downstream.

45. Each needle is used to puncture the liner, such that the needle tip is positioned in the inner felt. The needles are inserted so that they point horizontally in the direction of the resin. Each needle is anchored to the liner, and is connected to the vacuum pump by a hose. When the vacuum pump is activated, the needles draw

a vacuum from the inner felt through the tip of the needle. The needles apply vacuum simultaneously along the liner, to pull air from the inner felt layer, allowing the flowing resin to evenly soak or impregnate the inner felt.

46. A continuous uninterrupted vacuum is maintained at all times on the inner felt. When the resin approaches the first needle, that needle is removed and the hole sealed. When that needle is removed, the remaining needles positioned farther downstream continue to draw vacuum on the inner felt. Interruption of vacuum is avoided, since the needles continue to draw a vacuum beyond the isolated region closest the resin. The continuous vacuum zone extends approximately 30-50 feet along the liner.

Conclusory Findings

47. The Court has considered the evidence of the substantiality of the differences between Plaintiff's patent Claim 1 and the processes used by the Defendants. Defendants' Processes 1 and 2 do not differ substantially from the process disclosed in the '012 patent. They correspond in every detail to claim 1 of the '012 patent, perform the same function (producing effective vacuum at the resin front) by the same means (sequential application of vacuum to the interior of the liner at points along the liner as the liner is moved) and achieve the same result (uniform impregnation of the felt by the resin).

48. Defendants' Process 1 is the full equivalent of the process described in claim 1 of the '012 patent. It does the same thing by the same means to accomplish the same result. That is true of claim 1 as a whole. With respect to the individual elements of claim 1, Defen-

dants' Process 1 is the equivalent (same thing, same means, same result).

49. Defendants' Process 2 is the full equivalent of the process described in claim 1 of the '012 patent. It does the same thing by the same means to accomplish the same result. The purpose, function and result of the cup, as claim 1 points out in section (3), is to "prevent(s) ingress of air into the interior of the tube while the tube is being evacuated", which is precisely the purpose, function and result of the tube. Both the cup and the tube are, as claim 1 states, "connected by a flexible hose to a vacuum source", both are the means provided for the application of vacuum, they both do the same thing (suck a vacuum) by the same means (being connected to a vacuum source) to achieve the same result (produce a satisfactory vacuum at the resin front).

50. The vacuum at the resin front when carrying out the multiple-cup Process 1 or multiple-needle Process 2 may be somewhat more efficient, during the time that the vacuum cups are being shifted, however, modification by the addition of multiple cups to the process to create this additional efficiency does not avoid infringement by equivalency because the multiple cups perform the same function in the same way to achieve the same results.

51. Neither does the substitution of the needle for the cup avoid infringement by equivalency because the mere modification of this feature does not avoid the fact that the basic features of Claim 1 of the patent have been adopted. This new feature performs substantially the same function, in substantially the same way, to achieve substantially the same result. This apparatus distinction is irrelevant in the determination of whether

the Defendants' processes infringe under the doctrine of equivalents.

52. There is nothing in the file history of the '012 patent or the prior art which prevents claim 1 from covering Defendants' processes. The patentee originally claimed, in claim 1, all types of vacuum application, and in claim 4 he originally claimed the sequential application of vacuum. The prior art cited by the Examiner did not show that sequential vacuum application, and by amending the claims, the patentee abandoned protection broad enough to include all types of vacuum application but properly retained claims to sequential vacuum application, which is precisely what Defendants do in all of their processes.

53. The patent claims say nothing about whether the vacuum in the liner is continuous or not. In fact, the vacuum in the liner, including the vacuum at the resin front, is continuous in the process disclosed in the '012 patent. The sucking of air from the liner is discontinued during the time involved in shifting the vacuum cup, but a substantial and operatively effective vacuum remains active on the resin front throughout the process.

CONCLUSIONS OF LAW

1. The Constitution of the United States authorizes Congress to enact laws to promote the progress of science and useful arts by granting inventors exclusive rights to their inventions for limited periods. These grants, known as "patents", serve the advancement of science because, after the grant period of seventeen (17) years expires, the invention is given to the public for free use by all. As part of the Department of Commerce, the United States Patent and Trademark Office was set up for the purpose of granting patents. It is made up of

individuals with technical and legal training whose job it is to carefully review all applications of patents and to issue the patents when appropriate. Because patent examiners have technical and legal expertise, their decisions as to patentability are given great weight. Congress has passed a statute which requires courts to respect the decisions of these experts by resolving doubts as to whether granted patents are valid in favor of the inventor. This is known as the "presumption of validity". United States Constitution, Article I, Section 8, Clause 8; Title 35 United States Code.

2. A patent has one or more claims. The claims measure the invention. Each claim defines a separate, independent invention. *Continental Paper Bag Co. v. Eastern Paper Bag Co.*, 210 U.S. 405, 419, 52 L. Ed. 1112, 28 S. Ct. 748 (1908); *Ballantyne Inst. & Electronics, Inc. v. Wagner*, 345 F.2d, 671 (6th Cir. 1965).

3. Because the patent is presumed valid, to exercise the rights granted by the '012 patent, what the patent owner must do is prove that his patented invention is being used without his permission. This is called infringement. Plaintiff must prove infringement by a preponderance of the evidence. Once that is proved, the patent owner is then entitled to prevent further unauthorized use of the invention by means of an injunction, and to compensation for past unauthorized use. 35 U.S.C. 271, 283, 284; *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1054 (Fed. Cir. 1988) *cert. denied* 57 U.S.L.W 3281 (1988).

Infringement Generally

4. Whoever without authority makes, uses, or sells any patented invention within the United States during the term of the patent therefor, infringes the patent. 35

U.S.C. § 271. The party who asserts infringement has the burden of proving infringement by a preponderance of the evidence. *Braun, Inc. v. Dynamics Corp.*, 975 F.2d 815, 819 (Fed. Cir. 1992).

5. Infringement can be proved in either one of two ways. One way is by showing literal infringement. If Defendant's method falls clearly within the language of the claims, literal infringement is made out and that is the end of it. *Graver Tank & Mfg. Co. v. Linde Air Products, Co.*, 339 U.S. 605, 607, 94 L. Ed. 1097, 70 S. Ct. 854 (1950).

6. One may avoid literal infringement by using the essence of an invention, but not duplicating it exactly. To overcome this problem, and preserve to inventors what is rightfully theirs, it is well settled that even if there is no literal infringement, one can infringe if one employs a step or steps which are equivalent to those steps in the patent claim which are not met exactly. This rule, called the "doctrine of equivalents", prevents infringers from beating the system by making insignificant changes in the process to avoid literal infringement. *Graver Tank &. Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 607, 94 L. Ed. 1097, 70 S. Ct. 854 (1950); *Coming Glass Works v. Sumitomo Elec. USA, Inc.*, 68 F.2d 1251, 1258 (Fed. Cir. 1989). *Laitram Corp. v. Cambridge Wire Cloth Co.*, 863 F.2d 855, 856-7 (1988).

7. This case involves process claims. Equivalency is made out if the steps of Defendants' accused processes are either the same as the Plaintiffs claim (literal infringement) or the Defendants' processes perform substantially the same function as the corresponding step set forth in the claim in substantially the same way

to obtain substantially the same result. *Pennwalt Corp. v. Durand-Wayland Inc.*, 833 F.2d 931, 934 (Fed. Cir. 1987). This is known as infringement by equivalents. Something is "equivalent" if it does not substantially change the way in which the function of the claimed invention is performed. *Pennwalt*, at p. 935. A process may be found to be equivalent if after considering the substantiality of the claimed differences in the new process, the fact finder can conclude that the new process represents an insubstantial change. *Hilton Davis Chemical Co. v. Warner-Jenkinson Co.*, No. 93-1088, 1995 U.S. App. LEXIS 21069 (Fed. Cir. August 8, 1995) (per curiam).

8. The issue of equivalency is a question of fact. *Durango Associates Inc. v. Reflange Inc.*, 843 F.2d 1349, 1357 (Fed. Cir. 1988); *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1057 (Fed. Cir. 1988); *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d 1100, 1110 (Fed. Cir. 1987).

9. In accordance with equitable principles, for infringement to exist under the doctrine of equivalents an accused method must perform substantially the same function, in substantially the same way, to achieve substantially the same result as the invention defined by the claims. *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 608, 94 L.Ed. 1097 (1950).

10. To properly apply the *Graver Tank* "function-way-result" test, the function, way and result of each accused process (Process 1 and Process 2) are compared to the function, way and result of the method claimed in the '012 patent. *Malta v. Schulmerich Carillons, Inc.*, 952 F.2d 1320, 1327 (Fed. Cir. 1991); *Lear Siegler, Inc., v. Sealy Mattress Co. of Mich.*, 873 F.2d 1422, 1425-26

(Fed. Cir. 1989).

11. If the evidence shows that even one of these conditions is not satisfied, there can be no infringement by equivalents. *London,* 946 F.2d at 1539; *Johnston v. IVAC Corp.*, 885 F.2d 1574, 1581 (Fed. Cir. 1989); *Lear Seigler,* 873 F.2d at 1581.

12. Each of the three components (function-way-result) must be separately met. *Universal Gym Equip., Inc. v. ERWA Exercise Equip. Ltd.*, 827 F.2d 1542, 1548 (Fed. Cir. 1987). Defendants' Process 1 and Process 2 perform substantially the same function and achieve substantially the same results in substantially the same way as the method claimed in the '012 patent.

13. The doctrine of equivalents is subservient to the doctrine of prosecution history estoppel. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 939 F.2d 1540, 1544 (Fed. Cir.), *reh'g denied*, (1991). Prosecution history estoppel limits the doctrine of equivalents. *Charles Greiner*, 962 F.2d at 1036. Prosecution history estoppel is an equitable tool for determining the permissible scope of patent claims. *Mannesmann DeMag Corp v. Engineered Metal Products Co.*, 793 F.2d 1279, 1284-85 (Fed. Cir. 1986).

14. Although the prior art also limits equivalents, prosecution history estoppel and the prior art are separate and distinct concepts. The limits on equivalency imposed by prosecution history estoppel can be, and frequently are, broader than those imposed by the prior art. *Haynes Intern., Inc. v. Jessup Steel Co.*, 8 F.3d 1573, 1579 (Fed. Cir. 1993), *modified on reh'g*, 15 F.3d 1275 (Fed. Cir. 1994). In this case, the issue is whether prosecution history estoppel limits the doctrine of equivalents.

15. Prosecution history estoppel limits a patentee's reliance on the doctrine of equivalents by preventing him from contending later in an infringement action that his claims should be interpreted as if limitations added by amendment were not present. *Jonsson v. Stanley Works*, 903 F.2d 812, 821 (Fed. Cir. 1990).

16. Under the doctrine of prosecution history estoppel, where a patent applicant cancels a claim in the Patent Office to distinguish his invention from prior art, and replaces that claim with another claim, the patent owner is deemed to have surrendered the subject matter covered by the original claim, and cannot recapture that subject matter through the doctrine of equivalents. *Haynes*, 8 F.3d at 1577-78; *Wang Laboratories, Inc. v. Toshiba Corp.*, 993 F.2d 858, 868 (Fed. Cir. 1993); *Charles Greiner*, 962 F.2d at 1036; *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 681 (Fed. Cir. 1988). There is no surrendered subject matter under the facts of this case.

17. The legal standard for determining what subject matter was surrendered is an objective one, measured from the vantage point of what a competitor was reasonably entitled to conclude, from the prosecution history, that the application gave up to procure issuance of the patent. *Haynes*, 8 F.3d at 1577-78.

18. Whether or not estoppel exists is a question of law, *Wang Laboratories Inc. v. Toshiba Corp.*, 993 F.2d 858, 867 (Fed. Cir. 1993), and is determined in the context of the entire prosecution history of the patent — the prior art, the Examiner's rulings and the patentees arguments. In *Wang*, 993 F.2d at 858, when the original claims (for a circuit board with memory chips) were rejected as being unpatentable in view of prior art, the

applicant cancelled those claims, replacing them with new claims that required the memory chips to be "mounted in a single row." *Id.* at 867. Those claims eventually issued as part of the patent. The Defendants' accused devices ("lateral memory modules") had *two rows* of memory chips and therefore lacked the very limitation added by amendment (memory chips "mounted in a single row"). The district court permitted the jury to find infringement by equivalents. The Federal Circuit reversed. The court held that "prosecution history estoppel should have been applied to reach the conclusion that the accused lateral memory modules were surrendered during prosecution and therefore do not infringe under the doctrine of equivalents." *Id.* at 868. Even though the specific accused lateral memory modules were not cited prior art during prosecution, the Federal Circuit held that coverage of those devices was surrendered. *Id.* at 867-68.

19. The facts of the present case are distinguishable from the facts in *Wang*. In *Wang*, estoppel was found because in that case the patentee, in arguing to the Examiner, stressed the significance of mounting chips "only in a single row" and that limitation was added to the claims. There estoppel was found excluding multiple row mounting as antithetical to the arguments presented to the Examiner. Similarly in *Charles Greiner & Co. Inc. v. Marri-Med Mfg. Inc.*, 962 F.2d 1031 (Fed. Cir. 1992), the applicant during prosecution of the patent added to the claims the recitation that certain elements were located "only" at a particular location. Since in the accused device there was a different location, estoppel was found. There is nothing corresponding to that in this case.

20. When originally presented but abandoned claims contained limitations in dispute with respect to the applicability of the doctrine of equivalents, as is the case here, that is an important factor indicating the lack of applicability of the estoppel doctrine to those limitations. *Insta-Foam Products Inc. v. Universal Foam Systems Inc.*, 906 F.2d 698, 703 (Fed. Cir. 1990):

> For the reason that the allowed claim contains the same limitation regarding the connection between the trigger and plunger means as did the abandoned claim, the patent applicant did not disclaim anything relating to the manner by which the plunger and trigger are connected.

See also LaBounry Mfg., Inc. v. U.S. International Trade Commission, op. cit. *supra.*

21. In view of the facts in this case the doctrine of prosecution history estoppel is not available to Defendants.

22 . Defendants' single-cup process as described in Finding of Fact 29 does not infringe claim 1 of the '012 patent, under the doctrine of equivalents.

23. Defendants' Process 1 infringes claim 1 of the '012 patent under the doctrine of equivalents.

24. Defendants' Process 2 infringes claim 1 of the '012 patent under the doctrine of equivalents.

25. Plaintiffs are entitled to an immediate injunction against the carrying out by the Defendants of any of the infringing processes here dealt with and from carrying out any other impregnation process which infringes those claims.

26. Defendants are hereby enjoined from carrying out any of the two impregnation processes described herein which infringes upon the Plaintiff's claim.

27. A appeal as a matter of right is not appropriate under 28 U.S.C §1292(c)(2), on the issues of the validity of the '012 patent and infringement of that patent by the Defendants under the doctrine of equivalents or by literal infringement.

Signed this ___ day of _____,1995.

/s/ Vanessa D. Gilmore
VANESSA D. GILMORE
UNITED STATES DISTRICT JUDGE

APPENDIX I

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

INSITUFORM TECHNOLOGIES, INC.,
INSITUFORM (NETHERLANDS) B.V., AND
INSITUFORM GULF SOUTH, INC.,
Plaintiffs,
v.
CAT CONTRACTING, INC., MICHIGAN SEWER
CONSTRUCTION COMPANY, KANAL
SANIERUNG HANS MULLER GmbH & CO. KG,
AND INLINER U.S.A.,
Defendants.

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
ENTERED DEC. 01, 1995
Michael N. Milby, Clerk

CIVIL ACTION NO. H-90-1690

INJUNCTION

This case, and the issue of the validity and infringement by Defendants of Plaintiffs' U.S. Patent No. 4,366,012, issued December 28, 1982 and entitled "Impregnation Process," having been tried to a jury in 1991, and been the subject of rulings by the Hon. Lynn Hughes on post-trial motions by the Defendants; the issues of infringement having been further tried to this Court in 1995 and the issues having been fully briefed and argued by the parties; and this Court having on September 30, 1995 issued its Findings of Fact and Conclusions

of Law, subsequently amended, which in paragraphs 25 and 26 of the Conclusions of Law enjoined Defendants from carrying out certain infringing impregnation processes, and the Court having considered Plaintiffs' motion for a separate order granting injunctive relief,

IT IS HEREBY ORDERED AND DECREED that Defendants and each of them, their officers, agents, servants, employees, and attorneys, and all persons in active concert or participation with them who receive actual notice of this injunction by personal service or otherwise, are enjoined for the life of U.S. Patent No. 4,366,012 from carrying out any liner impregnation process in which the liner is moving and after the resin has been introduced into the liner and forced to flow toward a region of suction application spaced from the resin front, suction is applied through a window in the liner at said region and when the resin front approaches that region of suction application the suction is removed therefrom, that window in the liner is sealed, and the suction is then applied through a new window in the liner at a new region spaced downstream from the original region while the resin is forced to flow toward that new region.

The Clerk shall enter this Order and provide a copy to all parties.

SIGNED this 30th day of November, 1995.

/s/ Vanessa D. Gilmore
VANESSA D. GILMORE
UNITED STATES
DISTRICT JUDGE

APPENDIX J

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

INSITUFORM TECHNOLOGIES, INC.,
INSITUFORM (NETHERLANDS) B.V., AND
INSITUFORM GULF SOUTH, INC.,
Plaintiffs,
v.
CAT CONTRACTING, INC., MICHIGAN SEWER
CONSTRUCTION COMPANY, KANAL
SANIERUNG HANS MULLER GmbH & CO. KG,
AND INLINER U.S.A.,
Defendants.

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
ENTERED Dec. 01, 1995
Michael N. Milby, Clerk

CIVIL ACTION NO. H-90-1690

ORDER

This action having come on for trial before the Court, Honorable Vanessa D. Gilmore, District Judge, presiding, and this Court having made its Findings of Fact and Conclusions of Law; and it having previously come on for trial before the Court and a jury, Honorable Lynn Hughes, District Judge, presiding, at which time the issues were duly tried and the jury duly rendered its verdict, and a judgment notwithstanding the verdict having been entered,

IT IS ORDERED AND ADJUDGED:

1 . That claim 1 of Plaintiffs patent 4,366,012 of December 18, 1982 is valid;

2. That claim 1 of Plaintiff's patent 4,366,012 of December 18, 1982 has not been literally infringed;

3. That claim 1 of Plaintiff's patent 4,366,012 of December 18, 1982 has been infringed under the doctrine of equivalents;

4. That this is a final judgment in this case except for the ascertainment of infringement damages;

5. That Defendants are enjoined from carrying out either of the impregnation processes which Defendants at the trial characterized as Process I1 and Process 2, as set forth in the Injunction signed by this Court on November 30, 1995;

6. That the parties may proceed with discovery on the issue of infringement damages, including during the pendency of any appeal which may be taken from this Order; and

7. That Plaintiffs shall recover of Defendants the costs of this action as may be assessed by the Clerk.

The Clerk shall enter this Order and provide a copy to all parties.

SIGNED on the 30th day of November, 1995, at Houston, Texas.

/s/ Vanessa D. Gilmore
VANESSA D. GILMORE
UNITED STATES
DISTRICT JUDGE